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AMERICAN POTASH INSTITUTE, INC.

INVESTMENT BUILDING **WASHINGTON, D. C.**

Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Editor*

Editorial Office: Investment Bldg., Washington, D. C.

VOLUME XXII NUMBER NINE

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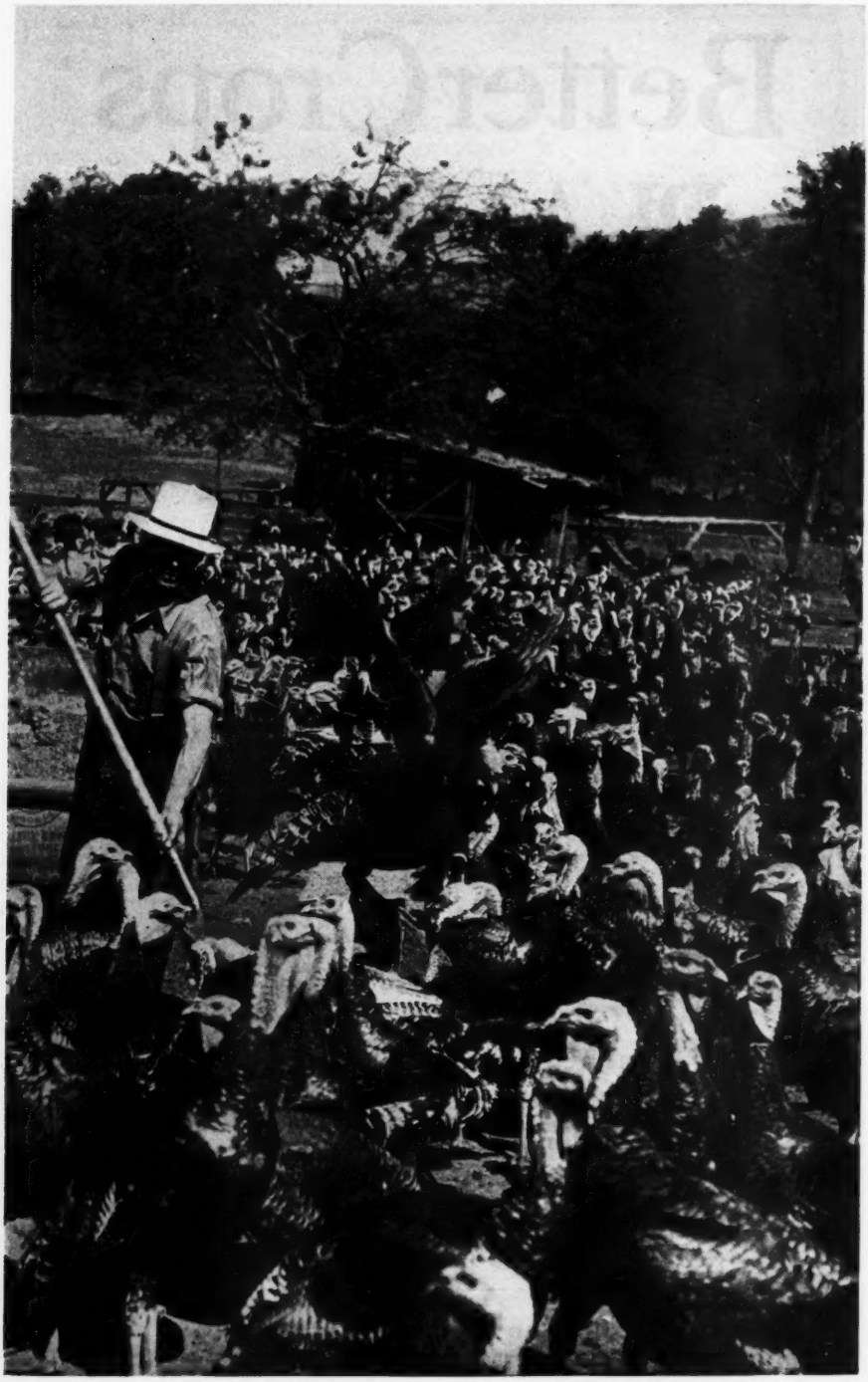

Roast turkey has become the holiday meat in America, and more than any other one dish, expresses the spirit of plenty on festive occasions.

Better Crops with PLANT FOOD

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VOL. XXII WASHINGTON, D. C., NOVEMBER 1938 NO. 9

A new source of rural redemption

Farm Samaritans

By Jeff McDermid

WITHIN the past three years there has emerged in American agriculture a new group of extension workers entrusted with the job of improving or restoring the morale of a certain stratum of rural society, which needs more than charts and test plots to guide its destiny.

Naturally, I refer to the Farm Security Administration, which once suffered under the benumbing cognomen of "Rural Rehabilitationers" —but that was before Rex Tugwell quit bossing them to enter the molasses business. Marse Henry Wallace has coined a snappier name for them, and they are taking on a new lease of life as a result of removing that woeful handicap in nomenclature.

I am supposed to know the work of these Security people fairly well, having become a member of an advisory committee in one of their districts; but readers should not stop at this point in anticipation that I may experiment somewhat on them in my alleged capacity as a surveyor and stooge. Such a calamity would deprive me of my periodic privilege in these columns, and as my chances to publish stuff on slick paper stock are limited, I shall refrain from any advisory overact, great as the temptation or the need may be.

It occurred to me while in the throes of conjuring what next to perpetrate,

that this number reaches readers about Thanksgiving time. Hence the idea of talking farm security popped up, because most of us in autumn begin to think of fuel, warm clothes, and plenty in the pantry. Or if we don't, we need rehabilitation or something else more drastic perhaps to make us fit to boss the family. And then, of course, a few of us realize we ought to be rehabilitated, but we are too debilitated in purse and pep to give a rap. And so here lies the job for the new era extensionists. So let's get down to details.

By this I do not mean "case work." The Lord forbid that I should turn this into a sociological seminar; and I am not conversant enough with the jargon of the slummers (at so much per slum). This smacks of snobbery and snoopery, and the Farm Security folks I know are too smart and too rough and ready to indulge in any such tenement tommy-rot. It just doesn't jibe with their own bucolic backgrounds.

As I see it in a symbolic way only, the original agricultural extension service might be likened to John the Baptist, and the F. S. A. folks are similar to the Good Samaritan. Looking at it in this way, there is nothing to get jealous over on either side or no cause for mean comparisons. Both of these saintly gents had their particular jobs to handle. We couldn't have got very far without one or the 'tother, but we've got to differentiate. You see, John was all for preaching and teaching, and warning folks—something like old Noah in a way.

JOHN pointed out a forthcoming path of redemption for sinners and weak sisters, while the G. S. rode along on his donkey toward Jericho looking out for somebody to salvage. But the chief difference between them does not lie in their religion or their ability or zeal, but in this one startling fact as related in the scriptures, namely: John the Baptist did not own an ass on which to carry anybody.

The G. S. had an ass—a good sturdy one too, and so he was able to do a little more for ordinary mortals than to give out the text and lead the hymns. The G. S. couldn't have done any more than J. B. if he was afoot, no matter how many thumbers showed up. And believe me, that's how we reach the conclusion that the F. S. A. is like the Good Samaritan, because Congress has pledged them to use an ear-marked fund for a job that the Extension force might also do if it had the same opportunity.

NOW perhaps in between this broad generalization we might add a few related facts of difference between these two worthy organizations. The F. S. A. is a mite more inclined to utilize non-collegiate assistants in actual field work than the older staff does. It picks out upstanding fellows with farm-life backgrounds, regardless of what degree they may have framed. We should expect that of course, because one who teaches by the book ought to pass a stiffer test than one who combines the offices of a banker, a nurse, and a Dutch uncle. Anyhow, I am an admirer of their broad gauged plan of choosing assistants, because if we had to abide by the professional sociological standard we'd inherit a bunch of long-haired graduates full of prunes and prejudice. Yes, I am confident that the county supervisors of the F. S. A. as selected today are doing pretty well without courses in academic psychology. Battling depression at the plow handles is good enough tonic for anybody who wants to uplift ruralites.

Many a dogmatic devotee of individualism tells me that there is no such thing as removal of agricultural hazards by law or government paternalism. Indeed they insist that some amount of risk is good for the soul, and that we breed a race of drifting easy-comers by such methods as we use in Farm Security work. But my own concept of true individualism carries with it a fair chance and a decent opportunity, because when cards are stacked your time

and skill amount to little in anybody's skin game.

I heartily agree that weather, crop damage, and price risks are not easily prevented by any act of Congress or declaration of policy. I admit concurrence in their suggestion that some folks are world-weary laggards and unfit to be redeemed at public expense. But I don't like to stand along with the doubter who laughs at soil erosion, for example, until it snakes its treacherous pathway into his own half-section. I believe there are insidious threats at universal farm prosperity which ought to be studied and stopped; and that mere teaching, charting, and lecturing won't insure us against calamity as well as a little investment and action. If we can't cure the disease maybe we can prevent its spread.

MOREOVER, the Good Book says we shall always have plenty of poor folks in our midst, and the same treatise is very charitable toward the poor in spirit as well. Manifestly the problem facing the F. S. A. is allied with the poor in spirit quite as much as with the poor in purse. In recent years we have adopted a regular "community welfare chest" in every sizeable urban area to meet such ever-present emergencies. Is it not proper to adopt a similar permanent set-up on the rural front?

Disadvantaged and underprivileged farm folks may be either renters or mortgaged owners of land. The Security plan has been directed toward both. In any case these operators of farms are stewards of our national soil resources, and the situation loses its sentimental aspects when we look at it from this angle. It may be hard sense to safeguard our soils by aiding operators without enough income or ability to do it alone. The other way would be to let prices sag to new lows, and let economic pressure drive these holdings into fewer but perhaps more capable hands—maybe! Yet we would take a chance there too, for absentee landlords or corporation managers are just as apt to lease the tracts to other operators under just as unfortunate terms and conditions, and subject to the same old price reactions. Unguided and unwarned, the rank and file would troop off into dilemma just as fast as ever. No extension system known to mankind could save them, sugar-coated or not.

Only a few weeks ago our party of "advisers" went to see a fellow off in the sticks who had obtained a subsistence loan from the F. S. A. allotment. He was under one of those unfair and impossible land contracts, given by a lumber company which had skinned the velvet off the area years ago and left stumps and slashings behind. Apparently he had tried to make a go of it and had a thrifty wife, but his cow stable was open to the sky and his barn yard a quagmire—most of the loan being used for feed and food. He was unable to make any payments on the ridiculous contract, and it seemed wasteful to sink any more funds in such a place because the terms were unfavorable to start with. This, however, was a rare combination of a poor operator and a bad real estate deal, and generally such kinds are avoided by the F. S. A.

On another place not far distant, a rehabilitation loan plus debt adjustment service by the Security people illustrated

(*Turn to page* 46)

Earn Soil Payments *With* Winter Legumes

By B. E. Grant

County Agricultural Agent, Bertie County, North Carolina

FOR the past 15 years the Extension Service has been carrying on an educational program of soil building in Bertie County, North Carolina, through the use of summer and winter legumes. Records of actual results of demonstrations on Bertie County farms have been secured over this 15-year period, but getting farmers to generally use these crops has been a slow process.

Since the first objective of the Agricultural Conservation Program is to maintain and improve soil fertility, the opportunity is offered to cash in on this educational program. In 1936 and 1937 farmers generally did not fully understand the farm program, particularly with reference to soil-building practices, and the weak point in compliance with the program was that farmers were not growing sufficient soil-building crops and carrying out enough soil-building practices to earn maximum payment. For example, they did not seed sufficient soil-building crops, such as lespedeza, crotalaria, and winter legumes, nor were fertilizing materials generally used in connection with the seeding of these crops, although credit was allowed in the program for these practices. We are advised that North Carolina farmers earned only 48 per cent of their maximum payment in 1937.

County Agent B. E. Grant checking hairy vetch seed from the freight car.

In the 1938 Farm Program we determined that an educational program would be put on to familiarize producers with soil-building practices that would count in reaching their soil-building goal, and to stress the importance of at least carrying out sufficient practices to reach the soil-building goal for the farm.

In this educational program we made use of the following methods: Committee meetings to explain to committeemen the plan and enlist their cooperation, newspaper articles in the county and State papers, circular letters on soil-building practices, the value of winter legumes for soil building, the plan for cooperating farmers to get winter legume seed as grants of aid in cooperation with the Agricultural Conservation Program, personal letters to producers stating the amount of seed they could get if they were cooperating, community meetings at which film

strips were shown on the use of legumes for soil building and the plan explained, personal contacts through field and office calls, order forms prepared and given to committeemen for them to contact the producers and get them signed.

In August of 1938 a series of educational meetings was planned for each of the nine townships of the county. In the meantime the State AAA Office advised us that the Washington AAA Office was thinking of conducting an experiment with four eastern North Carolina counties in which the Government would advertise for bids for hairy vetch and Austrian winter peas to be shipped to these four counties, with the AAA buying the seed and paying the freight. Under the plan proposed, cooperating farmers who would be entitled to payment under the 1938 program might receive up to 80 per cent of their maximum soil-building payment in seed to enable them to carry out additional soil-building practices in reaching their goal.

Second-year vetch being cut down with a stalk cutter on the farm of J. H. Jeringan of Aulander, N. C. The vetch was seeded in cotton and covered with a two-horse cultivator in September 1937.

Bertie County Included

We were advised that since some educational work had been conducted in Bertie County with winter legumes, it might be possible to get Bertie County included as one of the four counties. We were at once interested in the plan and so advised the State AAA Office, requesting full information. Under the plan Bertie County was scheduled to get 24,000 pounds of hairy vetch and 12,000 pounds of Austrian winter peas. The bid was let for 144,000 pounds of hairy vetch and 72,000 pounds of Austrian winter peas for the four counties.

We began an educational program for seeding winter legumes the latter part of August. The following mimeographed circular was prepared from the bulletin in which the soil-building practices of most interest to Bertie farmers were listed.

"The soil-building practices listed herein shall count toward the achievement of the soil-building goal to the extent indicated therein, when such practices are carried out in 1938 in workman-like manner and in accordance with good farming practices for the locality.

(A) Each of the following practices in the amounts specified shall be counted as one unit or one acre in reaching the soil-building goal:

1. In connection with the seeding of winter legumes, permanent pasture, lespedeza, or crotalaria, an application of 300 pounds of 16 per cent superphosphate or 100 pounds of triple superphosphate containing not less than 45 per cent of available phosphoric acid.

2. In connection with seeding of the above crops, an application of 200 pounds of 50 per cent muriate of potash.

3. Application of 500 pounds of basic slag in connection with the seeding of the above crops.

4. Reseeding permanent pasture with

not less than 10 pounds of adapted pasture grass or legume seed.

5. Application of ground limestone when applied at the rate of not less than 1,000 pounds per acre, 1,500 pounds to count as one unit.

(B) Seeding of permanent pastures and soil-building crops:

1. Each of the following shall count as one unit credit when seeded prior to October 31, 1938—crotalaria, carpet and dallas grass pasture, lespedeza, annual rye grass, vetch, Austrian winter peas, crimson and bur clover.

(C) Turning under certain crops for green manure:

1. Each of the following shall count as one unit credit when turned under—soybeans, cowpeas, vetch, rye, barley, wheat, oats. If these crops are left on land as a mulch and not harvested, they will count the same rate as if turned under.

(D) Each 2 acres of the following crops shall be counted as one unit:

1. Summer legumes, such as soybeans, cowpeas, and velvet beans, when interplanted or grown in combination with soil-depleting crops of which a good stand and growth are secured if plowed or disked under or left on the land.

"All of the above practices must be carried out prior to October 31 in order to count as credit on the 1938 Program, but the winter legumes, such as vetch, Austrian winter peas, and clover, should be seeded between September 1 and October 10, so a good stand and growth may be secured before cold weather.

"The rate of payment for carrying out the soil-building practices is $1.50 per unit or acre in the soil-building goal. This is enough to amount to about one-half of the cost of the seed for seeding vetch, Austrian winter peas, and clover. With this amount it is very little more expensive, if any, to seed these crops than it is rye, and since the payment of $1.50 will probably be allowed in the 1939 Program for turning them under, the total payment will amount to the approximate cost of the seed."

Following this, meetings were held in each township on the value of winter legumes for soil building. At these meetings U. S. D. A. film strips on green manuring, leguminous crops for the Southeast, and inoculation of legumes were shown. Pamphlets on winter legumes for soil improvement, which had been prepared in the County Office, were distributed. The plan for the AAA furnishing hairy vetch and Austrian winter peas to cooperating farmers was explained. We set our goal to take the orders that week for the carload of seed to be shipped to Bertie County. Others in the county thought we had bitten off a rather large order and set our goal too high, but before the end of the week we had signed orders for the carload and were not through with the educational program, so we informed the State Office we would have to have more seed and raised our goal to two cars.

Increased Seed Order

When the bids were closed on September 12, we were advised that our order could be increased to 32,000 pounds of vetch and 28,000 pounds of peas; but if we needed more, telegraphic bids would have to be gotten for the additional amount. We advised the State Office to increase our order to 60,000 pounds of vetch and 50,000 pounds of Austrian winter peas, as we had already raised our goal from two cars to three.

Following the series of educational meetings, newspaper articles explaining the program, goals established, and progress made were run in the county paper. Another circular letter explaining the plan and progress made was prepared and mailed to all work-sheet signers. Other meetings were held including committee meetings at which the cooperation of the committeemen in making the program as effective as possible was requested. Personal contacts with producers were made through field and office calls. Finally

a letter was prepared and sent to producers who had not placed orders for seed, showing the amount of vetch and peas they could get and how the seeding of these crops would enable them to reach their soil-building goal.

Since compliance work had not been completed when orders were taken for the seed, to check compliance on each farm for which a seed order had been received put a lot of extra work on the office force. Quite a few orders had to be turned down after compliance was checked, some of them representing large orders, on account of overplanting soil-depleting crops so that no payment could be made to the farm.

Before the seed arrived we realized that we had orders for more seed than had been shipped to us, and we began to plan on how to take care of the situation. Finally, we found that one of the other County Agents had ordered two cars consisting of 28,000 pounds of vetch and 12,000 pounds of peas each and did not think he would be able to use this amount. Arrangements were made with him and the State and Washington AAA Offices for one of these cars to be diverted to Bertie County.

On September 30 the 60,000 pounds of vetch and 50,000 pounds of peas were received in Windsor over the Carolina Southern Railroad. This is a local railroad which serves Bertie County, leading from Ahoskie on the Atlantic Coast Line to Windsor, the County Seat. It is largely owned by Windsor Township of Bertie County. The railroad cooperated with us in rendering the best service possible. They had notified us the day before that the seed would be delivered to us on that day, and we began sending out notices to farmers on the night before the arrival of the seed. The other car containing 28,000 pounds of vetch and 12,000 pounds of peas was received on October 3.

After the seed was inoculated, it was spread out to dry.

On the day the seed were received, farmers began hauling the seed to their farms in various conveyances, some getting one bag or more in a one-horse cart or buggy, others in their cars, some in pick-up trucks, and others in large trucks. F. H. Jeter, Agricultural Editor of the State Extension Service at State College, was kind enough to come down to take note of this event, and while here made a number of pictures

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Selling Forage as Steaks and Chops

*By E. W. Sheets**

Chief of the Department of Animal Husbandry, Mississippi State College, State College, Mississippi

IT IS a strange condition that the dish which forms the backbone of most of the square meals served in America is the least understood by our housewives and cooks. Until the kind and cut of meat are chosen, the choice of vegetables is in the dark, and salad and dessert may even be a matter of conjecture.

Unless meat and other livestock products are produced on the farm for home consumption, many families will be compelled through necessity to go without them much of the time. This is especially true when such products are high in price. Some may say if they do not produce these products it is an easy matter to go to most any modern meat shop or grocery and get them. It is not as simple as that. Most folks greatly desire them because they are so palatable, so rich in desirable and essential food nutrients, and because they make any meal taste twice as good. Wanting them and being able to buy them, even though essential for health and satisfaction, are two entirely different propositions. Unless these products are produced on the farm to be utilized there, they oftentimes are not bought because the cash necessary for their purchase is not available. Substitutes in name only but not in satisfaction and food value make the problems of the homemaker all the more difficult. While the very same problem

* Dr. Sheets was formerly Chief of Animal Husbandry in the U. S. Department of Agriculture.

A good forage crop usually means the maintaining of soil fertility as well as adequate feed for farm animals.

confronts the homemaker in the city as it does on the farm, the farm has the opportunity to produce such products with a very small cash outlay. It requires largely the desire, the plan, and the effort to supply them at least for home needs throughout the year, and some to sell for others to enjoy.

Our farmers have the grass, the roughages, the fattening feeds, and sufficient numbers of well-bred foundation stock to produce great quantities of choice meats both for home needs and the general demand for it. Our meat-packing industry is equipped to collect the fattened livestock not consumed on the farm, to properly slaughter it, chill it, cure it, and distribute it to the most remote corner of the country in refrigerated cars. And it is safe to assume that the meat-loving public would never forget the flavor and toothsomeness of choice beef, pork, lamb, and mutton, once they became acquainted with it.

There was a time when the livestock industry of the South was very seriously handicapped by a shortage of pastures, of desirable roughages, and of concentrates for fattening or winter use. Our Experiment Stations have determined and demonstrated the value and use of many new feeds especially adapted to our needs. When we think of fattening cattle, the great American crop, corn, usually comes to mind. It is well that it should, for corn *is* the great American crop. It is the most valuable crop grown in the United States, and is produced by about 5 million of our farmers on 100 million acres of our land. The crop totals nearly 3 billion bushels a year.

Corn Converted to Meat

And yet, if we tried to eat all the corn which we grow we would be a nation of gormands. Each man's share would be 24 bushels a year, which would make enough corn meal to furnish him a couple hundred muffins or about 600 griddle cakes for each breakfast during the year. The fact is that our people consume right here at home about 95 per cent of this great crop. How do we do it? The answer to this riddle is to be found in the fact that our livestock eat nearly seven-eighths of the corn crop, and that we are a nation of meat consumers. We eat our corn mostly as steaks and roasts and chops. Here is how we do it: Of the 24 bushels of corn produced per year per person, we eat on the average but 2½ bushels as corn in the form of corn bread, hominy, breakfast cereals, and so on. Nearly 10 bushels

Pastures and feeds are converted into a more delectable product which brings a better price on the market.

The trench silo is an economical means of storing feed for later use.

we consume as pork and lard. More than 3½ bushels of the 24 we eat as beef or drink as milk; while approximately 1 bushel of corn we consume annually in the form of chicken and eggs. We eat but a peck of corn each year as mutton and lamb.

Some people might wonder, particularly if they happened to be quite fond of corn bread and fried mush, or if they are among those who like meat so well that they are tempted to eat too much of it, why it might not be much simpler if we ate our corn as corn without going to the trouble of converting it into steaks and chops. Such a short cut would save time, as it takes, for example, 2, 3, or even 4 years to grow and fatten a steer. It would save corn, because even the hog, which is one of our most efficient meat factories, cannot grow a pound of pork from a pound of corn. It would save labor for the farmer, because he could haul his corn to market in the fall and loaf through the winter. It would save thousands of dollars of capital investment for each farmer, because he would have to build no more cattle barns, sheep sheds, and hog houses, nor spend money for livestock.

By-products Utilized

But let us look a moment at the other side of the picture. Maybe there are disadvantages that will make these advantages of dispensing with our livestock look trivial. Let us look at the beef steer which the farmer grows and fattens and ships to market. Only a small part of him has been grown from corn. This is especially true of southern steers. He has tucked away beneath his hide in the form of beef, great quantities of grass and grain-sorghums, or soybeans, corn stalks, hay, or other similar feeds. Nearly all of these feeds are not fit for man to eat. Some of them are crops which enable the farmer to rotate his land favorably and profitably. Others are virtually by-products of his business. Even if they could all be marketed as cash crops, the farmer would be robbing his soil of valuable and indispensable fertility if he hauled them away. When he drives these crops away on the hoof as hogs or cattle or sheep or workstock, or when they are taken to town as milk, chicken, and eggs, the farmer is conducting his business in a business-like fashion. He is removing from the soil only the minimum of plant-food elements which may be economically returned by applying superphosphates and potash periodically as required. He is maintaining the richness of his land. He is making good use of by-products that he would otherwise have to burn or waste. He is following a system which enables him to practice modern scientific methods of crop rotation. And at the same time he is providing the Nation with some of its most substantial foods—beef, pork, lamb, and poultry meat as well as wool, leather, and other by-products of the livestock industry.

But now back to grass. It is both a blessing and a problem. Many sections of the South have excellent grass —so luxuriant that they have gone on for years unmindful of the tremendous advantage, at times, of feeding a small amount of grain supplements with this

grass. Other sections can grow better grass if they will do so; and still others have yet to find pasture crops and a system of seeding and grazing management which will make the most of their conditions of soil and climate.

Well-planned Program

It is not by any means so simple as growing good grass, and the livestock will follow as fleas follow dogs. It may be a question of nicety of management of livestock and young forests and grass on the same area. It may be a question of the legitimate competition of other crops. Such considerations will naturally divide the South into rather definite regions so far as profitable livestock production goes. Regions will be found in the same State, often in the same county, which are well adapted to the production of both feeder and finished cattle, or either, depending upon the choice of the individual. Other regions will greatly excel in one, while still others may prove entirely unsuited to anything but mutton and wool production, or to swine production, or to combinations of these, due to their nearness or distance to market, their cropping possibilities, and even the training, the capability, and the inherited preferences of the farmers themselves. For, when every other condition for livestock farming has been met, we still must reckon with the matter of personal equations. We must have farmers who are sold on the idea and who are making livestock production the balance wheel of their farm program.

Having previously discussed pastures in relation to livestock production,* emphasis is given to the immediate problem in the South, which is the utilization of the hay, grain-sorghums, soybeans, sorghum silage, and similar crops produced in great abundance. It is doubtful if these feeds can be as profitably utilized in any other manner as they would be if fed to farm animals to supply home needs and cash, or for the improvement in soil fertility. The farmer who can utilize such crops to best advantage is the one who has carefully planned his farm operations with that in view.

In considering the need for making the greatest possible use of forage crops with livestock, two groups of farmers are kept in mind. One is that group which produces the pasture, feed, and forage crops necessary to properly feed the livestock required to furnish meat and other products for home use. The other is the group which seeks to provide for farm needs and in addition sup-

* See February, 1938, issue of this magazine.

There is a sense of security on a self-sustaining livestock farm.

ply the market, besides increasing the cash income for the farm family. This group has an important problem to solve. To utilize such crops to pay taxes, operating expenses, and receive a cash return for their labor and efforts is a matter of immediate concern.

Economical Production

It has been proven that the feeds produced throughout the South in such large quantities are well adapted to the economical production of meat animals, both for home use and for sale. In the hands of those who know from experience how to use them, such feed crops may be advantageously marketed in this manner. Some of those who have produced large amounts of feed crops have done so without determining in advance just how they were to be used. After the crops were produced in the farming program which they followed, many came to a realization of the fact that unless such crops were properly utilized by livestock beyond supplying home needs, their chances for a satisfactory cash return from their land were not bright.

While they could and on many farms should use them for soil-improvement purposes, yet the urgent need for a cash income in addition to supplying home needs to help meet current expenses makes it difficult if not impossible for many to forego the opportunity rather than wait for returns a year or more in the future.

As great as the feed and forage production seems to be, yet it is barely sufficient to feed properly the livestock now on our farms. It is largely a question of proper distribution in order that they be adequately and profitably fed and the feeds available marketed through them to best advantage. This desire on the part of many who have not heretofore marketed their crops through farm animals has led some to go on the markets to purchase livestock with the hope of more profitable returns. While it is possible for some farmers to jump into the livestock business and market their crops for cash to better advantage than by following any other system, it is important to emphasize the fact that those who grow into the business and plan their operations more carefully well in advance, to at least supply home needs, are the ones who are usually the most successful.

There are many farmers who fail to produce feed and forage crops to properly feed their livestock, whether they are to be used on the farm or sold on the market. As a result, their farm animals are inadequately provided for and they have instead a food and feed bill that takes most of the profits from the cash crop which they have grown.

A problem that confronts many farmers today is how to utilize most profitably the large amounts of rough feeds which have been produced. Unless he has planned to utilize this vast quantity of pasture, hay, and other roughages with livestock, he is likely to be confronted with the difficulty of selling it, plowing it under, or buying the livestock on the market to consume them, hoping that the returns will be profitable to him. In many instances the livestock purchased in this manner will cost him more than necessary and in some instances may not be especially suited for the utilization of the feeds available.

Utilize Roughages

The South is fortunate in always having an abundant supply of cottonseed meal which is available everywhere. The immediate problem then, if he is to feed livestock, may be to plan to utilize the roughages, possibly with cattle, using a maximum amount of cottonseed meal and a minimum amount of grain. The best procedure would be to turn the cattle, which have been grazing on pasture until the middle of September, on the grain-sorghum, soybean, stalk fields, or other roughages until they are harvested, then put them in the feed-lot and supply a liberal amount of cottonseed meal with silage and hay for a short feed.

The profits of the stockman in utiliz-

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A bunch of Pascal celery from each plot, after coming from the pit, December 30. Treatment, from left to right: 1-check, 2-phosphate (extra), 3-manganese, 4-magnesium, 5-lime, 6-borax, 7-borax and chemicals, 8-potash (extra), 9-check.

Extra Potash & Borax Grew Good Celery

By John C. Handy

Associate County Agricultural Agent, Middlesex County, Concord, Massachusetts

"I THINK I know how to grow some real celery next year," said Gardner Lawrence, Concord, Massachusetts, vegetable grower, following field trials of eight fertilizer materials on six vegetables in 1937. "Extra potash and a little borax—that combination is what my soil needs." The demonstration had shown that a serious boron deficiency existed. Every application of boron increased yields and quality of celery. Returns per plot ranged from $3.40 to $3.91 where borax was used on early celery.

The most surprising result of the trials was the effect of potash. In the face of boron deficiency, extra potash produced the tallest celery and a profitable yield, with a value of $3.27. Celery from the lime plot was worth only 58 cents, and from check plots, $1.91.

The extra growth and vigor of the potash plot was the first difference to appear, long before any symptom of boron deficiency was evident. At harvest time the potash plot still stood tallest, but slight stem cracking lowered the grade. Mr. Lawrence believes that a combination of potash and borax will give the best yield and quality.

Demonstration plots were started at the Lawrence farm after total failure of the 1936 celery crop in one field.

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High-quality Tomatoes Must Have Potash

By R. J. Bryden

Soil Specialist, Ontario Agricultural College, Guelph, Ontario

HIGH-QUALITY canned fruits and vegetables have been the aim of Smart Brothers ever since they began their canning operations more than thirty years ago, near the town of Collingwood, Ontario. Every effort has been put forth to turn out a fine product to meet the exacting demands of the buyers.

In addition to the canning factory, this concern operates a 500-acre orchard and truck farm producing rhubarb, spinach, beets, carrots, asparagus, string beans, cabbage, pumpkins, tomatoes, strawberries, raspberries, apples, cherries, plums, and pears. Here every step from the preparation of the soil for the growing of the crop to the careful selection and grading of the fruit is considered as essential as the proper method of processing, if satisfactory results are to be obtained.

With this idea in mind, Smart Brothers are keenly interested in keeping up the fertility of their soils.

To use the words of John L. Smart, who has charge of the farm division, "It is absolutely essential that we have a fairly definite knowledge of the productive capacity of our soils and that we maintain a fairly high level of fertility to insure quality and quantity in our products."

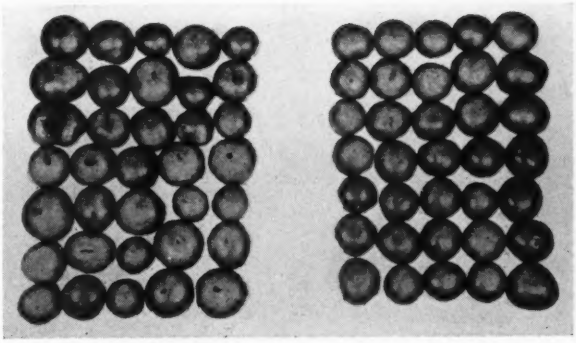
During the past 10 years they have been heavy users of commercial fertilizers and look upon the proper use and application of fertilizers as a prime necessity. They have cooperated with the Chemistry Department of the Ontario Agricultural College in the conducting of experiments on various crops with different analyses of fertilizers, and have become particularly interested in soil testing to determine existing conditions in their fields and orchards. Mr. Smart has frequently remarked that if they had not used fertilizers, they would not be able, under present conditions of low prices and high overhead, to continue in business.

One of their main canning crops is tomatoes, and for the past several years they have been canning the crops from approximately 175 acres. About 50 acres on their own farm are devoted to this particular crop, and the balance is grown by local farmers having from 2 to 8 acres each.

Soil Samples Tested

In order to secure uniformity, Smart Brothers grow the plants for these farmers, using two varieties—John Baer and Canners Red. The latter variety was obtained from the Ontario Agricultural College about 25 years ago and appears to be very suitable for the Georgian Bay District. Last Spring, well before planting season, a soil-testing day was held at the factory. On this day the growers brought in soil samples from their fields which were to be planted to tomatoes. These samples were tested by a representative from the College, and fertilizer recommendations made on the basis of the test results.

In 1937 the Brothers had one 40-acre field of Canners Red tomatoes which showed considerable leather-end. As



Picture of the blossom-end of tomatoes. Note the irregular size and shape and the prevalence of leather-end in the low-potash tomatoes on the left. The extra potash plot (right) had no leather-end at all.

any considerable quantity of leather-end results in a great deal of wastage when it comes to canning or juicing the crop, they were particularly anxious to overcome this condition. Soil samples were taken from this field and sent to the College where the soil was analyzed.

The results of the analysis were as follows:

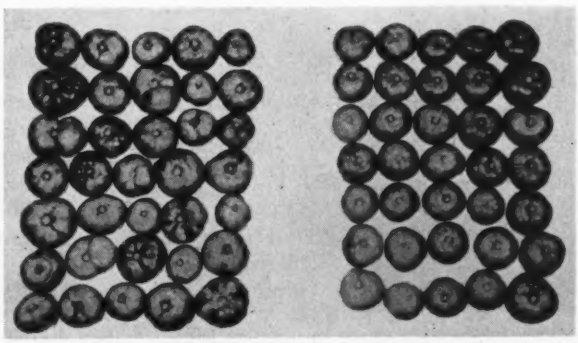
Reaction	— 7.3
Nitrate N.	— High
Phosphorus	— Medium
Potassium	— Low
Calcium	— High
Magnesium	— Medium

An application of 1,000 pounds of 2-12-10 fertilizer per acre was recommended. The previous year a 2-12-6 fertilizer had been used at the same rate on this soil. At the same time Smart Brothers were asked to treat one acre of this field with an additional 400 pounds of 60 per cent muriate of potash to determine whether or not under these particular conditions the potash would improve results.

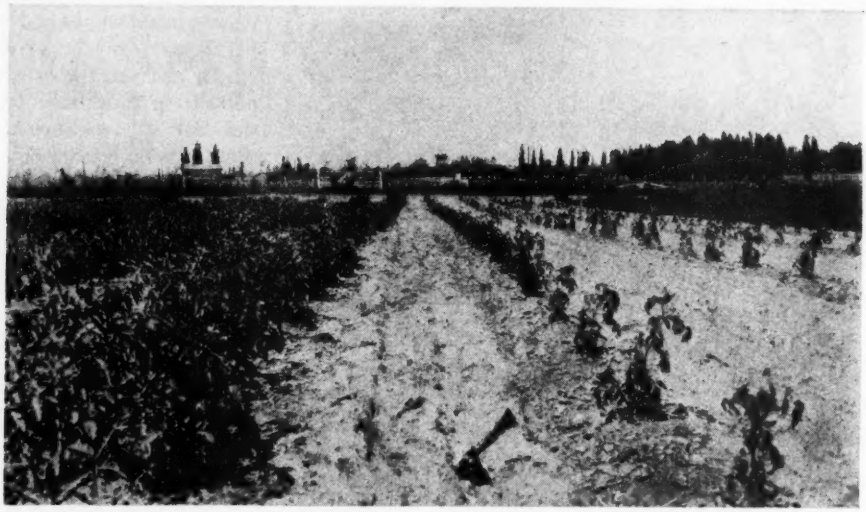
On this 40-acre field in 1937 there was at least 30 per cent leather-end. This year, 1938, with a 2-12-10 fertilizer replacing the 2-12-6 analysis, the leather-end was reduced to about 15 per cent. On the acre which received the extra potash in addition to the 2-12-10 mixture, there was no leather-end whatsoever. In other words, in this instance the additional potash proved its worth in assisting in the production of high-quality tomatoes.

Smart Brothers took one day's picking from the extra potash plot and ran through some 70 cases of juice made entirely from the tomatoes grown on this special acre plot. Using the standards set by the Dominion Government for determining the grade, these tomatoes gave a higher grade than the tomatoes from the general field run and approached the highest grade, known as fancy.

While the writer was at the plant on the day that the tomatoes from this extra potash plot were being processed, he noticed the loads of tomatoes being brought in by the various farmers. One load brought in by farmer X appeared to have considerable leather-end. Upon inquiring from the weigh clerk, he was informed that this grower had considerable leather-end all through and was unable to pick more than half of his crop. The next farmer to weigh



Picture of the stem end of tomatoes. Note the irregular shape and size and the extensive cracking of the lower potash plot. The tomatoes on the right received extra applications of potash.



A demonstration plot on the Smart Brothers' Farm. The tomatoes at the left received a fertilizer high in potash; those on the right were not fertilized.

in his load had a load of uniform, red, ripe tomatoes without the least sign of leather-end. The clerk volunteered the information that this particular grower always had top-quality tomatoes and received no dockage.

In order to find out why one grower in the same district with the same variety of tomatoes had high-quality and another grower had considerable leather-end, we visited both of these farms. Soil samples were taken and analyzed at the College.

The results of the analyses are as follows:

Mr. X high per cent of leather-end.

Reaction — Alkaline
Potassium — Very Low
Phosphorus — High
Calcium — High
Magnesium — Medium
Nitrate N. — Low

Mr. Y no leather-end.

Reaction — 6.3
Phosphorus — Medium
Potassium — Very High
Calcium — Medium
Magnesium — Medium
Nitrate N. — Low

Upon inquiring as to the fertilizer practice of these two growers, we found that Mr. X used 1,000 pounds of a 2-12-6 fertilizer applied with a Planet Jr. fertilizer distributor a few days ahead of planting. Mr. Y used 500 pounds of a 2-12-10 mixture. This field also received about 15 tons of well-mixed barnyard manure applied in the winter and disked in during the spring previous to plowing.

The test results were as follows:

Check Plot, No Treatment.

Reaction — 7.4
Phosphorus — High
Potassium — Very Low
Calcium — High
Magnesium — High
Nitrate N. — Medium

Fertilized Plot, Plus Extra Potash.

Reaction — 7.5
Phosphorus — M+
Potassium — Very High
Calcium — High
Magnesium — High
Nitrate N. — Medium

As indicated by the tests made on these two soils, Mr. Y's soil showed a very high supply of available potash,

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Mr. E. I. Morrison Diversifies Farming

By Joe E. Walker

Shreveport, Louisiana

ACCORDING to E. I. Morrison, Georgetown, Grant Parish, Louisiana, profit from any crop can be increased by the use of fertilizer. In 1937 by using a total of 18,600 pounds, or 443 pounds per acre on 42 acres of row crops, he proved his belief by putting it into practice.

Prior to 1928 Mr. and Mrs. Morrison divided their time between teaching school and farming. Since then, however, they have found it more profitable to devote the whole of their efforts to the farm. Of their 338 acres, 71 acres, protected from erosion by more than 3 miles of terraces, are subject to cultivation; 160 acres have been reforested to native pine trees which Mr. Morrison says he will never cut, leaving them for his children to harvest; and the other 107 acres are taken up in house and barn sites and a woods pasture.

In 1937, 24 acres were planted to corn. This crop received 400 pounds of complete fertilizer per acre, and a yield of over 900 bushels of corn was produced. Nine acres of cotton which received a total of 4,500 pounds of complete fertilizer produced 8 bales. Mr. Morrison could have planted 10.5 acres to cotton but since 1934, when he found he could produce his allotment of tax-free cotton on less than his allowed acreage, he has cut his cotton land more than that required by the Agricultural Adjustment and Agricultural Conservation Acts.

A 14-acre meadow produced 600 bales of hay and another 13 acres were planted to clover for pasture. One and one-fourth acres in garden furnish fresh vegetables for the table almost all the year.

Mr. Morrison has been growing sweet potatoes 16 years and has been using fertilizer on them practically every year

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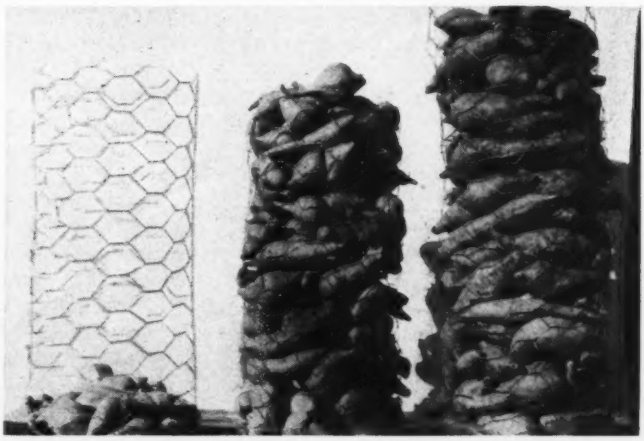

On the E. I. Morrison farm, Georgetown, Louisiana, no fertilizer (left) produced 39 bu. of sweet potatoes, 500 lb. of 4-12-4 (center) produced 248 bu., and 800 lb. of 6-10-7 (right) produced 296 bu.

How to Fertilize Cotton in Georgia

By E. C. Westbrook

Cotton and Tobacco Specialist, Georgia Agricultural Extension Service, Athens, Georgia

"HOW should I fertilize my cotton?" This question is asked by thousands of Georgia farmers every year. In this State the Georgia Experiment Station, at Experiment, and the Coastal Plain Experiment Station, at Tifton, have been at work for years seeking the answer to this all-important question. Farmers located in various sections of the State are aiding with these fertilizer experiments.

During the 18-year period, 1919 to 1936, inclusive, these stations conducted tests dealing with ratios of nitrogen, phosphoric acid, and potash; rates per acre; sources of phosphoric acid, nitrogen, and potash; ratio of organic and inorganic nitrogen; time of applying nitrogen materials; side-dressing with nitrogen and potash; comparative value of high analysis, concentrated fertilizers and low analysis, standard materials; home-mixed versus commercial mixed fertilizers; acid and basic mixtures; minor elements; placement of fertilizer with reference to seed; and other phases of the subject. Many of these tests were conducted away from the stations in cooperation with farmers.

Results of these numerous experiments, together with comments on their practical application, are recorded in Bulletins 151, 152, and 196 and in the 49th Annual Report of the Georgia Experiment Station, at Experiment, and in Bulletins 26 and 28 of the Coastal Plain Experiment Station, at Tifton.

A careful study of these data, as they apply to farming systems practiced in this State, leads to this conclusion and recommendations: The best all-round fertilizer for cotton on average Georgia soils is one that supplies 30 to 36 pounds of nitrogen, 32 to 48 pounds of phosphoric acid, and 24 to 36 pounds of potash per acre. This is equivalent to from 400 to 600 pounds of a 4-8-6 fertilizer plus a side-dressing of 75 to 100 pounds of nitrate of soda or some other quick-acting nitrogen fertilizer. A 4-8-6 fertilizer is one that contains 4 per cent nitrogen, 8 per cent phosphoric acid, and 6 per cent potash.

New Regulations

The Georgia fertilizer law was amended recently. The law now requires that for fertilizer formulae the nitrogen be expressed first, phosphoric acid second, and potash last. The old law required that phosphoric acid be expressed first, nitrogen second, and potash last. An 8-4-6 under the old law becomes a 4-8-6 under the new law. The new law also requires that the nitrogen be expressed in terms of nitrogen instead of ammonia and in whole numbers.

It is recognized that in actual farm practice certain variations from this specific recommendation will be desirable. For example, on newly cleared land or land which has not received much phosphate for a number of years, and on some limestone soils in northwest Georgia, more phosphate may be needed. Also, more phosphoric acid may be used on some soils which are abundantly supplied with moisture and where a winter legume is turned under

and on soils that have a tendency to grow a large weed or where heavy applications of barnyard manure have been made.

There are very few soils in the State that do not need 36 pounds of nitrogen per acre. If this amount of nitrogen is applied early in the season (either at planting or chopping time), it will hasten the maturity of the cotton. There are a few exceptional soils in the State, mostly bottom land soils, which grow a large weed and keep a deep green color throughout the season, and on these soils less nitrogen should be used.

On some of the heavier Piedmont soils the potash may be decreased to 24 pounds per acre. On some of the sandier soils of the Piedmont and on some of the grey pebble soils of south Georgia, it will pay to use more than 36 pounds of potash per acre. This additional potash can be applied as a side-dressing of from 50 to 100 pounds of muriate of potash per acre at chopping time.

Despite variations in local conditions throughout the State, it is believed that an application, at or before planting, of 400 to 600 pounds of a 4-8-6 fertilizer per acre supplemented with a side-dressing of 75 to 100 pounds of some quick-acting nitrogen material at chopping time will meet the needs of the cotton crop about as well as any general recommendation which can be made at this time.

Should the farmer choose to use 3-9-5, 3-8-8, 4-8-4, 5-7-5, or similar mixture, a sufficient amount of side-dressing should be applied to bring the total nitrogen up to 30 to 36 pounds and the potash application up to 24 to 36 pounds per acre. Varying the amount of nitrogen in the mixture affects the yield more than a similar variation in either phosphate or potash.

A ready-mixed fertilizer analyzing 8-8-8 (N P K) applied at the rate of 400 pounds per acre would be a good fertilization for most Georgia soils. However, such mixtures as 4-8-6, 4-10-4, 5-7-5, and 4-8-4 in north Georgia and 3-9-5, 3-8-8, and 4-8-6 in south Georgia are popular among Georgia farmers. Usually such mixtures are applied all before planting. Where less than the recommended amount per acre is used or when one or more of the elements is too low, it may be advisable to make up the difference by side-dressing. An ample supply of nitrogen is essential for high yields.

Left: This plot has been fertilized with sulphate of ammonia for 4 years. The acidity had become so great that the cotton died. Right: This plot received the same fertilizer treatment plus enough dolomitic limestone to a little more than neutralize the acidity.

A mixture composed of 200 to 300 pounds per acre of superphosphate, 100 pounds sulphate of ammonia, 100 pounds of dolomitic limestone, and 50 to 75 pounds of muriate of potash at planting time, plus 100 pounds of nitrate of soda per acre at chopping time would supply the recommended amount of plant food. Other materials, adapted to the practice and carrying equivalent amounts of equally efficient plant foods, may be used with satisfactory results.

Station Recommendations

For a number of years the Coastal Plain Experiment Station, at Tifton, has recommended 400 to 600 pounds of a 3-9-5 fertilizer at or before planting to be supplemented with about 100 pounds of nitrate of soda or its equivalent at chopping time. On the basis of more recent experimental data, agronomists at the Coastal Plain Experiment Station have reached the conclusion that 400 to 600 pounds of a 3-8-8 fertilizer supplemented with about 100 pounds of nitrate of soda or its equivalent as a side-dressing at chopping time would be about the most profitable fertilization for cotton. However, if winter legumes are turned under preceding the cotton, the side-dressing of nitrogen may be omitted on soils that have a tendency to make excessive weed growth when legumes are turned under.

Generally speaking, the Tifton pebble soils appear to be more deficient in potash than any of the other south Georgia soils. When cotton follows a crop of peanuts or sweet potatoes, it is especially desirable to apply liberal amounts of potash to the cotton.

In the most recent findings of the Georgia Experiment Station, at Experiment, based on 6 experiments and 49 demonstrations located in all sections of the State, the largest profit was obtained from 32 pounds of nitrogen, 32 pounds of available phosphoric acid, and 32 pounds of potash per acre. These quantities of plant food can be supplied in the following ways:

1. By applying 400 pounds of an 8-8-8 fertilizer per acre before planting.
2. By applying 400 pounds of a 4-8-8 fertilizer per acre and side-dressing with 100 pounds of nitrate of soda or its equivalent in other forms of nitrogen.

These recommendations are made for average Georgia conditions and should be modified to meet special conditions.

On heavy soils that are not subject to leaching about the same yields have been obtained where all of the nitrogen was applied at the time or before planting as compared with applying a part of it at planting and the remainder as a side-dressing at chopping time. However, on sandy soils that are subject to leaching, better results have been obtained by applying a part of the nitrogen at or before planting time and the remainder as a side-dressing at chopping time.

Farmers who prefer to apply a part of their nitrogen or potash, or both, as a side-dressing will find this a practical thing to do. For example, the farmer may purchase a 4-8-4 fertilizer to use at or before planting. By using 100 pounds of nitrate of soda as a side-dressing, the farmer can step the nitrogen up to 8 per cent. If he wants to step the potash up to 8 per cent also, then he can do so by side-dressing with 32 pounds of muriate of potash. If additional nitrogen and potash both are needed, they may be supplied by using a nitrogen-potash side-dresser.

Plant Indicates Needs

The cotton plant itself is often a good indicator of fertilizer needs. Cotton rust or early shedding of the leaves and failure of the bolls to open properly may indicate the need for additional potash or magnesium, or both. Potash will reduce the loss from wilt in fields that are deficient in potash, although it is not a cure for cotton wilt. In the northern half of Georgia potash deficiency is more noticeable on the grey or sandy soils and on flatwood soils than it is on the red clay lands.

When used as the sole source of nitrogen, highest returns have been obtained

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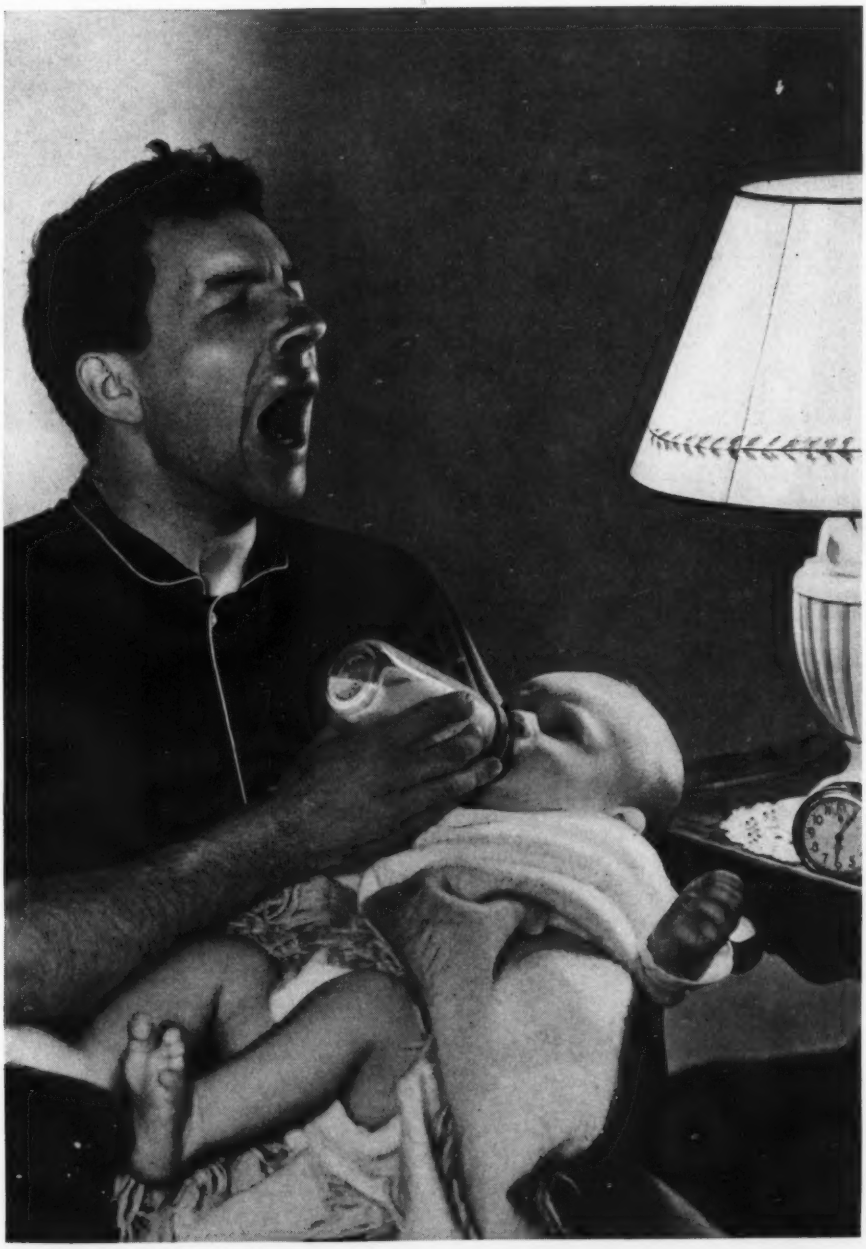
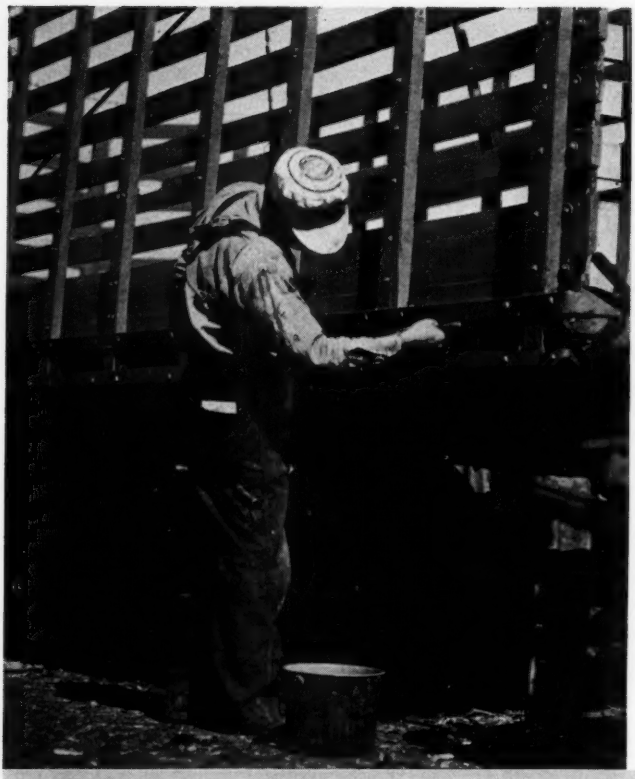
PICTORIAL



Many weird sounds accompany the break of day.

Primitive in many of its phases, Chinese agriculture is picturesque to Western observers. Above: The "watch duck" guarding his flock. Below: Culture of bamboo shoots, famous Chinese vegetable.

Although steeped in the tradition of their ancestors, Chinese farmers like to exchange ideas. Above: Country folks at an agricultural fair. Below: Threshing rice, the "staff of life."



Left: A farmer's life is a varied one, involving a range of interests from the study of related sciences to skill in the various trades. "Spare time," of which there is little, can always be filled with some "upkeep" job which has had to be side-tracked for more important work.

Below: Charles Peacock of Arriba, Colorado, is pictured using the machinery he created for conserving soil and moisture in the Great Plains area. It is called the damming method of farming, as it collects snow and rain in the hollows, preventing erosion and loss of soil by run-off.

The Editors Talk

British-American Trade Agreement

On November 17 the much heralded British-American Trade Agreement was finally signed, thus setting the stage for a new wave of public comment expressing opinions largely dominated by the political viewpoint of the individual writers. So much has been said about this particular trade agreement that the fundamental facts are pretty widely understood. It would appear that the chief point to be remembered from the provisions of the agreement is that about one-fifth of the American exports go to Great Britain and Canada, and that there is a pretty close balance between exports and imports to the two countries, with about one-fifth of our imports coming from the United Kingdom and Canada. Of all the agricultural exports to the two countries, cotton, wheat, and lard are the most important.

Our foreign trade problem probably has received more attention from those interested in American Agriculture than from anyone else. Programs for stimulating exports of agricultural products at prices comparable to the protective prices and wages of industry are not new. The famous McNary-Haugen Bill is well within the memory of most of us, and the veto of the late President Coolidge is the only thing that kept that program from becoming an actuality. For many years following the close of the World War, exports to foreign countries were stimulated through loans by the United States, which in turn were used for the purchase of our products. In recent years the piling up of surpluses of some of the key agricultural products has led to renewed vigor on the part of the proponents of legislation aimed at stimulating agricultural exports.

Improved farm practices, favorable weather, and high crop yields have largely been responsible for the almost unbelievable production of cotton and wheat. At the present time we have an all-time high in the production, carry-over, and supplies of cotton, and the wheat situation is rapidly approaching the cotton problem in magnitude. Because of mounting agricultural surpluses and a seemingly impossible task of expanding our domestic market in line with the rapid expanse of agricultural production, many schemes for expanding our foreign market have been concocted in the fertile brains of agricultural leaders, politicians, and economists, but the reciprocal trade idea has received the greatest attention of the administration leaders. An argument in favor of the reciprocal trade policy is that many of the other methods which have been suggested and are still being advocated do not consider the ability of importing countries to pay for our exports.

It is axiomatic under present conditions that for the United States to enjoy a thriving volume of foreign commerce, we must find means whereby our foreign customers can secure exchange to buy our products. Within recent years we have seen importing countries purchase products of an inferior quality or at higher

prices than those prevailing in the United States for the simple reason that means of payment could not be established with this country. It is hoped through a more equitable adjustment of tariff duties and quotas that means of payment will be established.

There is little doubt that a trade program as large in scope as the United Kingdom, Canada, and the United States agreement will have far-reaching influence on the international trade of all nations involved. From the purely agricultural viewpoint, it is rather doubtful if the agreement will have much direct influence. The shifting of wheat to the free list will undoubtedly improve our possibility of achieving the 100-million-bushel export goal. Wheat from the United States, which had been competing in the face of a duty equivalent to about 7¢ a bushel, will now be placed on an equal footing with wheat from the provinces within the British Empire.

Placing of lard on the free list probably will not gain a greater proportion of the British market for the American producer of pork products, but it will place lard on a better competitive basis with the substitute fats which have been developing back of a British duty. The situation in this country with respect to balance between production and consumption of pork products has not reached a stage as yet where prices have been depressed unduly, but it must be admitted that with the present favorable corn-hog ratio and the current trend in hog production, it is time that some thought is given to the future expansion of American pork products in the world market.

Although Great Britain is the leading customer for the South's No. 1 cash crop, by virtue of the fact that cotton exports to Japan have been restricted in the past year, there is little direct benefit to be allocated to cotton. It is, of course, to be expected that the cotton producer will participate in any general increase in trade between the two countries resulting from the agreement.

Aside from the possible increase in exports of many of our minor commodities, such as prepared fruits, citrus juices, etc., it would seem that the only encouragement that can be offered to the farmer as a result of the trade agreement program is of a long-time nature and will be more or less a result of the general advance in trade, rather than impetus to any of the individual products.

Erratum: Our attention has been directed to an error in figures on plant-food removal in the article "Potash Saves Alfalfa, Clover, and Soybeans," by A. W. Blair and A. L. Prince which appeared in the October 1938 issue of Better Crops With Plant Food. The third from the last paragraph of the article, page 37 in the magazine: "Four tons of alfalfa, which is a good acre-yield for three cuttings, will remove about 68 pounds of potash (K_2O), and 130 pounds of lime (CaO). It would require 136 pounds of 50% muriate of potash annually to meet this potash demand, not to mention the amount required to replace that lost through leaching and soil erosion" . . . should have been: Four tons of afalfa, which is a good acre-yield for three cuttings, will remove about 168 pounds of potash (K_2O), and 130 pounds of lime (CaO). It would require 336 pounds of 50% muriate of potash annually to meet this potash demand, not to mention the amount required to replace that lost through leaching and soil erosion. . . .

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Fertilizers, Soils, Crops, and Economics. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

¶ Pennsylvania farmers will find that State Agricultural Extension Circular 208, "Fertilizing Farm Crops," by J. B. R. Dickey, a very helpful and practical source of information on the intelligent use of commercial fertilizers. In addition to fertilizer suggestions for potatoes, wheat, and other small grains, corn, soybeans, timothy, alfalfa, clover, and permanent pastures based on field experiments and good farm practice, the author gives attention to such important subjects as higher analysis fertilizers, fertilizer ratios, method of application, and soil tests.

While slight variations from any particular analysis for a given crop in all probability will give little or no difference in results, there is no real reason for the infinite variety of analyses offered, Professor Dickey states. The higher analysis fertilizers now available make it desirable to base recommendations on the best ratio or proportion of plant-food elements, rather than a definite percentage of each. To bring out this point he shows that a 1-2-2 ratio suitable for potatoes and furnishing 200 to 240 pounds of plant food would be represented by a 4-8-8 analysis at 1,000 to 1,200 pounds per acre, 5-10-10 at 800 pounds and 8-16-16 at 500 pounds per acre. From 40 to 80 pounds of plant food for the grain crops are usually advised, which may be applied in a 1-6-3 ratio such as 2-12-6 or 3-18-9 analyses.

The circular mentions additional ratios and analyses for these and other farm crops to meet various soil and cropping conditions.

"The Production of Artificial Manure on the Farm," Agr. Exp. Sta., Gainesville, Fla., Press Bul. 517, August. 1938, F. B. Smith.

"Commercial Fertilizers and Legumes," Agr. Ext. Serv., State College, Miss., Ext. Cir. 101, June 1938, J. W. Willis.

"Magnesium as a Factor in Nitrogen Fixation by Soybeans," Agr. Exp. Sta., Columbia, Mo., Res. Bul. 288, July 1938, Ellis R. Graham.

"The Value of a Ton of Farm Manure in the North Platte Valley," Agr. Exp. Sta., Lincoln, Nebr., Bul. 318, May 1938, Lionel Harris.

"Virginia Field Crop Fertilizer Recommendations," Agr. Ext. Serv., Blacksburg, Va., Cir. E-341, July 1938.

Soils

¶ "To Hold This Soil," by Russell Lord, is a very interesting and thought-provoking publication on soil conservation, presenting a story of American soil from the earliest records to the present. Issued as Miscellaneous Publication 321 of the U. S. Department of Agriculture, it describes and illustrates with pictures what has been happening to soils that have been carelessly managed, as well as what can be done to prevent the devastating effects of soil erosion. The author follows the historic march of land occupation across the continental United States. He emphasizes that there is no simple cure-all for soil erosion, but shows how contouring, crop rotations, terracing, and other proved measures of curbing erosion can be formulated into a well-rounded program to save the soil.

"Some Profile Characteristics of the Pine-growing Soils of the Coastal-plain Region of

Arkansas," Agr. Exp. Sta., Fayetteville, Ark., Bul. 361, June 1938, Lewis M. Turner.

"Relative Productivity of Soils in Arkansas," Agr. Exp. Sta., Fayetteville, Ark., Bul. 365, June 1938, R. P. Bartholomew and O. R. Younge.

"Terracing, an Important Step in Erosion Control," Agr. Exp. Sta., Columbia, Mo., Bul. 400, July 1938, Marion Clark and J. C. Wooley.

"Soils of Petroleum County," Agr. Exp. Sta., Bozeman, Mont., Bul. 363, Aug. 1938, L. F. Gieseker.

"Soil and Moisture Conservation in Nebraska," Agr. Ext. Serv., Lincoln, Nebr., Ext. Cir. 118, June 1938, D. L. Gross and E. H. Doll.

"Some Interrelationships Between Soil Characteristics, Water Tables, Soil Temperature, and Snow Cover in the Forest and Adjacent Open Areas in South-central New York," Cornell Univ. Agr. Exp. Sta., Ithaca, N. Y., Memoir 213, June 1938, J. N. Spaeth and C. H. Diebold.

"Soil Erosion Control in Oklahoma," Agr. Ext. Serv., Stillwater, Okla., Gen. Ser. 56, Cir. 218, Revised 1938, W. H. McPheters.

"Synthetic Compost for Mushroom Growing," Agr. Exp. Sta., State College, Pa., Bul. 365, June 1938, J. W. Sinden.

"Soil Conservation Districts, How Farmers Can Organize Them, How They Help Control Erosion," Agr. Ext. Serv., Madison, Wis., Cir. 290, Aug. 1938.

"Soil Survey of Licking County, Ohio," U. S. D. A., Washington, D. C., Series 1930, No. 48, Jan. 1938, Robert Wildermuth, W. D. Lee, A. H. Paschall, and J. G. Steele.

"Soil Survey of Wayne County, Pennsylvania," U. S. D. A., Washington, D. C., Series 1932, No. 25, April 1938, C. S. Simmons, C. H. Atkinson, and L. A. Brown.

"Soil Survey of Halifax County, Virginia," U. S. D. A., Washington, D. C., Series 1934, No. 5, Mar. 1938, R. C. Jurney, S. O. Perkins, R. E. Devereux, S. S. Obenshain, Edward Shulkcum, and G. W. Patteson.

"Selenium Occurrence in Certain Soils in the United States with a Discussion of Related Topics, Third Report," U. S. D. A., Washington, D. C., Tech. Bul. 601, May 1938.

Horace G. Byers, John T. Miller, K. T. Williams, and H. W. Lakin.

"Chemical and Physical Properties of Certain Soils Developed from Granitic Materials in New England and the Piedmont, and of Their Colloids," U. S. D. A., Washington, D. C., Tech. Bul. 609, June 1938, Irvin C. Brown and Horace G. Byers.

"Conservation and Use of Soil Moisture at Mandan, N. Dak.," U. S. D. A., Washington, D. C., Tech. Bul. 617, June 1938, J. C. Thysell.

Crops

¶ Florida Agricultural Experiment Station Bulletin 325 entitled, "Preliminary Pasture Clover Studies," by Roy E. Blaser, gives a thorough discussion of winter pasture clovers best adapted to Florida. Methods of establishing clovers for grazing, some mineral deficiency symptoms, and grazing management are summarized along with other important considerations. Success with clover is dependent upon a soil supplied with lime, phosphorus, potash, and perhaps other nutrient materials in some cases; proper inoculation; and the choice of soil types adequately supplied with winter moisture. The nutrients to be added vary with types of soil and previous soil treatment. During the 1937-38 season 2,000 pounds of lime, 600 pounds of superphosphate, and 100 pounds of muriate of potash per acre gave good results. Manure may be added for still better results, and light applications of nitrogen appear somewhat beneficial. Growth of clovers is influenced by the degree of inoculation as well as plant nutrients and moisture supply. Where clover was planted on dry soils such as Norfolk fine sand, it resulted in complete failures.

Even though these studies are preliminary in nature and cover a short time, the observations reported in this bulletin are full of information that should lead to a better program of providing winter pasturage in Florida.

"Improvements in the Technique of Cotton Hybridization," Agr. Exp. Sta., Fayetteville, Ark., Bul. 359, June 1938, L. M. Humphrey and A. V. Tuller.

"Outlying Cotton Variety Experiments, 1936 and 1937," Agr. Exp. Sta., Fayetteville, Ark., Bul. 360, June 1938, L. M. Humphrey.

"Growing Better Potatoes in Colorado," Agr. Exp. Sta., Fort Collins, Colo., Bul 446, June 1938, C. H. Metzger.

"Ornamental Hedges for Florida," Agr. Exp. Sta., Gainesville, Fla., Bul. 323 (Revision of Bul. 172), Aug. 1938, Harold Mowry and R. D. Dickey.

"Grape Growing in Florida," Agr. Exp. Sta., Gainesville, Fla., Bul. 324, Sept. 1938, R. D. Dickey and Kenneth W. Loucks.

"Soybeans as a Cash Crop," Agr. Ext. Serv., Ames, Iowa, Ext. Cir. 248, Apr. 1938.

"Flax Production in Kansas," Agr. Exp. Sta., Manhattan, Kan., Cir. 191, Apr. 1938, F. E. Davidson and H. H. Laude.

"Kentucky Fruit Notes," Agr. Exp. Sta., Lexington, Ky., Vol. 1, Nos. 1 & 2, Aug. & Sept. 1938.

"A Machine for Cleaning Tobacco Seed," Agr. Exp. Sta., Lexington, Ky., Bul. 381, July 1938, L. S. O'Bannon and W. D. Valleau.

"List of Publications of the Agricultural Experiment Station, 1885-1937, Agricultural Extension Division, 1911-1937," Agr. Exp. Sta., Lexington, Ky., Dec. 1937.

"Sugar Cane Variety Report Seasons of 1935-36-37," Agr. Exp. Sta., University, La., Bul. 297, July 1938, C. B. Gouaux.

"Production and Certification of Seed Potatoes," Agr. Ext. Serv., College Park, Md., Bul. 83, May 1938, Dr. R. A. Jehle.

"Winter Barley in Maryland," Agr. Exp. Sta., College Park, Md., Bul. 416, April 1938, R. G. Rothgeb and W. B. Kemp.

"Tomato Leaf Mold as Influenced by Environment," Agr. Exp. Sta., Amherst, Mass., Bul. 350, May 1938, E. F. Guba.

"Producing Sugar Beets," Agr. Ext. Serv., East Lansing, Mich., Ext. Bul. 67, (Revised) July 1938, G. F. Wenner.

"Quality Production of Wheat and Barley," Agr. Ext. Serv., University Farm, St. Paul, Minn., Pamphlet 51, May 1938, W. W. Brookins.

"Making the Home Lawn," Agr. Ext. Serv., University Farm, St. Paul, Minn., Sp. Bul. 130, Revised May 1938, L. E. Longley.

"Forty-fourth Annual Report, Agricultural Experiment Station, University of Minnesota, July 1, 1936 to June 30, 1937," Agr. Exp. Sta., University Farm, St. Paul, Minn.

"Annual Report of Cooperative Extension Work in Agriculture and Home Economics, Mississippi, 1937," Agr. Ext. Serv., State College, Miss., Ext. Bul. 94, June 1938, E. H. White, Dir.

"Hardiness Investigations with the Apple," Agr. Exp. Sta., Columbia, Mo., Res. Bul. 289, July 1938, Frank Horsfall, Jr., and C. G. Vinson.

"Apical Dominance in Shoots and Proximal Dominance in Roots as Related to Structural Framework of the Apple," Agr. Exp. St., Columbia, Mo., Res. Bul. 293, Sept. 1938, Frank Horsfall, Jr., and C. G. Vinson.

"Fruit Cracking of Tomatoes as Influenced by Applying Potassium Permanganate to Soils in Which the Transplants Are Grown," Agr. Exp. Sta., Bozeman, Mont., Bul. 362, Aug. 1938, V. E. Iverson.

"Brome Grass for Erosion Control," Agr. Ext. Serv., Lincoln, Nebr., Ext. Cir. 119, June 1938, E. H. Doll and D. L. Gross.

"The Vitamin A Content of Soybean Silage and of A. I. V., Molasses, and Common Corn Silages, and the Effect of Feeding These Materials upon the Vitamin A Content of Milk," Agr. Exp. Sta., Lincoln, Nebr., Res. Bul 101, June 1938, I. L. Hathaway, H. P. Davis, and J. C. Brauer.

"Questions and Answers Relative to Asparagus Production," Agr. Exp. Sta., New Brunswick, N. J., Bul. 650, June 1938.

"Improved Strains of Acala Cotton for New Mexico," Agr. Exp. Sta., State College, N. Mex., Bul. 256, May 1938, G. N. Stroman.

"Determination of Stringiness in Celery," Cornell Univ. Agr. Exp. Sta., Ithaca, N. Y., Memoir 212, May 1938, Denzel S. Curtis.

"Investigations in Plot Technic with Small Grains," Cornell Univ. Agr. Exp. Sta., Ithaca, N. Y., Memoir 214, June 1938, H. H. Love and W. T. Craig.

"New or Noteworthy Fruits: XII. Small Fruits," Agr. Exp. Sta., Geneva, N. Y., Bul. 680, July 1938, George L. Slate.

"The Black-spot Disease of Roses, and Its Control under Greenhouse Conditions," Cornell Univ. Agr. Exp. Sta., Ithaca, N. Y., Bul. 690, Apr. 1938, E. W. Lyle.

"Farm Research," Agr. Exp. Sta., Geneva, N. Y., Vol. IV, No. 4, Oct. 1, 1938.

"Annual Report of Agricultural Extension Work in North Carolina 1937," Agr. Ext. Serv., Raleigh, N. C., I. O. Schaub, Dir.

"The Bimonthly Bulletin," Agr. Exp. Sta., Wooster, Ohio, Vol. XXIII, No. 194, Sept.-Oct. 1938.

"Department of Agriculture of Oregon Bulletin," Salem, Oreg., No. 81, Sept. 1938.

"The Cotton Contest—1937, for Better Yield and Staple Value," Agr. Ext. Serv., Clemson, S. C., Cir. 162, May 1938, R. W. Hamilton and B. E. G. Prichard.

"Extension Work in South Carolina 1937, a Review of Agricultural Progress," Agr. Ext. Serv., Clemson, S. C.

"Ten Years of Experimental Results on Cultivated Pastures," Agr. Exp. Sta., Brookings, S. Dak., Bul. 324, June 1938, T. M. Olson and T. A. Evans.

"Small Grain in Contour Furrows on Lespedeza Sod," Agr. Ext. Serv., Knoxville, Tenn., Pub. 214, Aug. 1938.

"Twenty-third Annual Report of Cooperative Extension Work in Agriculture and Home Economics, State of Vermont, for the Year 1937," Agr. Ext. Serv., Burlington, Vt., Ext. Bul. 23, May 1938, J. E. Carrigan, Dir.

"The City Home Garden," U. S. D. A., Washington, D. C., Farmers' Bul. 1044, Revised Mar. 1938, W. R. Beattie.

"Currants and Gooseberries, Their Culture and Relation to White-Pine Blister Rust," U. S. D. A., Washington, D. C., Farmers' Bul. 1398, Revised April 1938, George M. Darrow and S. B. Detweiler.

"Culture and Pests of Field Peas," U. S. D. A., Washington, D. C., Farmers' Bul. 1803, June 1938, Roland McKee and H. A. Schoth.

"Report on the Agricultural Experiment Stations, 1937," U. S. D. A., Washington, D. C., July 1938, J. T. Jardine and W. H. Beal.

"Why Red Clover Fails," U. S. D. A., Washington, D. C., Leaf 110, Revised 1938, E. A. Hollowell.

"Planting Southern Pines," U. S. D. A., Washington, D. C., Leaf 159, June 1938, Philip C. Wakeley.

"Crimson Clover," U. S. D. A., Washington, D. C., Leaf 160, June 1938, E. A. Hollowell.

"The Forest Products Laboratory, A Brief Account of Its Work and Aims," U. S. D. A., Washington, D. C., Misc. Pub. 306, 1938.

"The Distribution of Important Forest Trees of the United States," U. S. D. A., Washington.

D. C., Misc. Pub. 287, April 1938, E. N. Munns.

Economics

¶ The Mississippi Department of Agriculture has recently released their statistical sheet, "County Fertilizer Data: Mixed Goods and Materials," for the fertilizer year July 1, 1937 through June 30, 1938. The material is based on a compilation of notices of shipments received from manufacturers and guarantors of fertilizer materials during the period, and is particularly valuable because it not only gives the total tonnages of the various analyses sold, but also divides the State up by counties and the grades sold within counties.

According to the report, the total sales for the 1937-38 period were greater by about 45,000 tons than sales from July 1, 1935 through June 30, 1936, but were about 35,000 tons under the figures for the corresponding 1936-37 period. The totals were 265,182 tons in 1937-38, 300,561 tons in 1936-37, and 219,250 tons in 1935-36.

By far the most important single analysis of mixed fertilizer sold was 4-8-4, which represented 106,579 tons of the total of 141,366 tons of mixed goods sales. Next in importance was 4-8-8 with 9,675 tons, followed by 6-12-6 with 8,489 tons, and 6-8-4 with 8,473 tons.

In the Mississippi report only 15 different analyses are listed. In some States it is not uncommon for the total to exceed 150 or 10 times as many different grades. In addition to the sales of mixed fertilizer in 1937-38, 89,340 tons of nitrogenous materials, 26,805 tons of phosphates, and 7,669 tons of potassium materials were sold, which compare to sales of 103,641 tons of nitrogenous materials, 40,099 tons of phosphates, and 8,360 tons of potassic materials sold in 1936-37.

¶ "Agricultural Production in New York, 1866 to 1937," by T. E. LaMont, is the title of an interesting survey of changes in New York agriculture. Since the turn of the century, there have been a great many changes in agriculture in the United States, particularly in the northeastern section. In the State of New York, according to Mr. LaMont, there has been a decrease of 4,200,000 acres of land in farms during the 55-year period (1880-1935), but the total agricultural production of the State has increased by 20%. He notes that this increase is due largely to increases in efficiency in agricultural production, brought about by the increased use of commercial fertilizers and lime, better farm practices, the use of more suitable land, improved varieties of crops, better control of insects and diseases, etc. Many who have been close to agriculture during the past 40 or 50 years often fail to realize the extent to which scientific methods and research have actually influenced our agriculture. The bulletin is especially interesting from this standpoint, since it does bring to light in a rather clear perspective the actual increases in efficiency that have resulted largely from the application of scientific methods to farming.

Data concerning most of the important crops grown in the State of New York are included in the work. Production per acre of crops other than fruit has been weighted by importance of the crop and has increased 21% from 1899 to 1934. This increase was caused by higher yields per acre and by shifts to more intensive crops. The higher crop yields are due, to a large extent, to the use of more fertilizer. It is noted that since 1924, between 2 and 2½ times as many tons of fertilizer have been used in New York State as were used in 1899.

In discussing livestock production, it is noted that the production of milk per cow in 1934 was more than double that of 1864. Brought about largely by the greater demand for milk, this increase is probably due to the change from the dual purpose type of cattle and the breeding of higher producing cows, combined with improved feeding practices and methods of caring for the dairy herd.

Perhaps as important as any one

thing has been the increased efficiency of production per man on the New York farms, which has about doubled in the past 60 years. Here again this increase is due to the higher yield of crops, greater efficiency in the production of livestock, and the use of improved machinery.

Of the total gross income derived by the New York farmers between 1926 and 1930, approximately 47% was from milk, 11% from eggs, potatoes and other vegetables about 14%, and fruit about 8%.

¶ According to the latest report from the Kansas Board of Agriculture Control Division, "Tonnage of Fertilizer Reported by Manufacturers as Shipped to Kansas During 1937," the total amounted to 12,114 tons. Since 1932 there has been a steady increase in fertilizer sales in Kansas. In that year only 1,199 tons were reported. In 1936, 4,605 tons were reported. Since the report does not give the data by analyses, it is not possible to calculate the actual plant food.

"Index Numbers of Prices Received for Arkansas Farm Products, 1910-1937," Agr. Exp. Sta., Fayetteville, Ark., Bul. 363, June 1938, W. T. Wilson and Stuart L. Bryan.

"Classified Fertilizer Sales as Reported to Date for the Quarter Ended June 30, 1938," State Dept. of Agr., Sacramento, Calif., Sept. 26, 1938, Dr. Alvin J. Cox.

"Prices as Related to Quality on the Connecticut Strawberry Auctions," Agr. Exp. Sta., Storrs, Conn., Bul. 227, Feb. 1938, G. B. Clarke and R. G. Bressler, Jr.

"Farm Practices and Their Effects on Farm Earnings," Agr. Exp. Sta., Urbana, Ill., Bul. 444, Aug. 1938, M. L. Mosher and H. C. M. Case.

"Illinois Farm Economics," Agr. Ext. Serv., Urbana, Ill., No. 40, Sept. 1938.

"Illinois Crop and Live Stock Statistics Issued by the Illinois Co-operative Crop Reporting Service, Crops 1936-1937, Live Stock 1937-1938," State Dept. of Agr., Springfield, Ill., Cir. 439.

"Farm Economic Facts," Agr. Ext. Serv., Amherst, Mass., Vol. XI, No. 7, Sept. 1938.

"Crop Report for Michigan," State Dept. of Agr., Lansing, Mich., Sept. 1938 and Oct. 1938.

"Farm Business Notes," Agr. Ext. Serv., University Farm, St. Paul, Minn., No. 189, Sept. 1938.

"Better Potatoes—More Money," Agr. Ext. Serv., University Farm, St. Paul, Minn., Ext. Bul. 195, Aug. 1938, W. C. Waite, D. C. Dvoracek, and V. C. Norton.

"Economic Studies of Dairy Farming in New York, XIII. 100 Grade A Farms in the Tully-Homer Area, Crop Year 1936," Cornell Univ. Agr. Exp. Sta., Ithaca, N. Y., Bul. 696, May 1938, E. G. Misner.

"Economic Studies of Dairy Farming in New York, XIV. Factors Affecting Premiums Received in Grade-A-Milk Production," Cornell Univ. Agr. Exp. Sta., Ithaca, N. Y., Bul. 698, June 1938, E. G. Misner.

"An Economic Study of the Marketing of Western New York Potatoes by Motor Truck," Cornell Univ. Agr. Exp. Sta., Ithaca, N. Y., Bul. 700, June 1938, P. J. Findlen.

"Farm Adjustments in Saluda County, South Carolina," Agr. Exp. Sta., Clemson, S. C., Bul. 315, June 1938, M. C. Rochester and Oscar Steanson.

"A Study of the Farm Business of 99 Farms in the Towns of Underhill and Jericho, Vermont, January 1, 1937-December 31, 1937," Agr. Ext. Serv., Burlington, Vt., Brieflet 496, June 1938, R. P. Davison and H. I. Miller.

"Department of Agriculture-Immigration of Virginia," Richmond, Va., Buls. 362 and 364, Aug. 1938 and Oct. 1938.

"Fruit Trees in Yakima County, Washington," Agr. Exp. Sta., Pullman, Wash., Bul. 359, Mar. 1938, Carl P. Heisig and Ben H. Pubols.

"Migratory Farm Labor and the Hop Industry on the Pacific Coast, with Special Attention to Problems of the Yakima Valley, Washington," Agr. Exp. Sta., Pullman, Wash., Bul. 363, Aug. 1938, Carl F. Reuss, Paul H. Landis, and Richard Wakefield.

"Southeastern Idaho Land Utilization Project," U. S. D. A., Washington, D. C., 77437, 1938.

"Agricultural Programs and the Processing Tax," U. S. D. A., AAA, Washington, D. C., Gen. Inf. Series, G-87, Sept. 1938.

"Farmers and the Surplus Problem," U. S. D. A., AAA, Washington, D. C., Gen. Inf. Series, G-88, Sept. 1938.

"Questions and Answers About Farm Exports and Farm Imports," U. S. D. A., AAA, Washington, D. C., Gen. Inf. Series, G-85-Rev., Revised Sept. 1938.

"An American Income for Cotton," U. S. D. A., AAA, Washington, D. C., Gen. Inf. Series, G-89, Oct. 1938.

"An American Income for Wheat," U. S. D. A., AAA, Washington, D. C., Gen. Inf. Series, G-90, Oct. 1938.

"Crop Insurance for Wheat Growers," U. S. D. A., FCIC, Washington, D. C., Gen. Inf. Series, No. 1, 1938.

"Economic Justification for Certain Salient Provisions of the Regulations, Application, and Policy for Wheat Crop Insurance with a Brief History of the Program and a Brief Outline of the General Plan of Operation," U. S. D. A., FCIC, Washington, D. C., Gen. Inf. Series, No. 2, April 1938.

"Amended Marketing Agreement Regulating the Handling of Citrus Fruit Grown in Cam-

eron, Hidalgo, and Willacy Counties in the State of Texas," U. S. D. A., AAA, Washington, D. C., Markt. Agree. Series, A-10, Amended, 1938.

"Amended Order of the Secretary of Agriculture Issued Pursuant to Public Act No. 10, 73d Congress, as Amended and as Reenacted and Amended by the Agricultural Marketing Agreement Act of 1937, Regulating Such Handling of Grapefruit and Oranges Grown in Cameron, Hidalgo, and Willacy Counties in the State of Texas as Is in Interstate or Foreign Commerce, and as Directly Burdens, Obstructs, or Affects Interstate or Foreign Commerce," U. S. D. A., AAA, Washington, D. C., Order Series, O-15 Amended, 1938.

"The No-control Cotton Plan," U. S. D. A., AAA, Washington, D. C., 38-Cotton-4, Sept. 1938, I. W. Duggan.

"Protection for Wheat Incomes, the AAA Wheat Plan to Balance Supplies with Domestic Use and Exports," U. S. D. A., AAA, Washington, D. C., Com. Inf. Series, 38-Wheat-3, Aug. 1938.

"The AAA Corn Plan," U. S. D. A., AAA, Washington, D. C., Com. Inf. Series, 38-Corn-3, Aug. 1938.

"Determination of Fair and Reasonable Wage Rates for Persons Employed in the Production, Cultivation, or Harvesting of the 1938 Crop of Sugar Beets, Pursuant to the Sugar Act of 1937," U. S. D. A., AAA, Washington, D. C., S. D. 24, Revised Sept. 19, 1938.

"Determination of Farming Practices to be Carried out in Connection with the Production of Sugarcane in the Mainland Cane Sugar Area During the Crop Year 1938, Pursuant to Subsection (e) of Section 301 of the Sugar Act of 1937, as Amended," U. S. D. A., AAA, Washington, D. C., S. D. 31, Sept. 19, 1938.

"Determination of Fair and Reasonable Prices for the 1938 Crop of Louisiana Sugarcane, Pursuant to the Sugar Act of 1937," U. S. D. A., AAA, Washington, D. C., S. D. 44, Sept. 23, 1938.

"Revision of Prorations of the Quota for Foreign Countries other than Cuba," U. S. D. A., AAA, Washington, D. C., G. S. Q. R. Series 5, No. 5, Sept. 8, 1938.

"The 1939 Wheat Program in the Northeast Region," U. S. D. A., AAA, Washington, D. C., NER-306, Aug. 1938.

"Agricultural Statistics 1938," U. S. D. A., Washington, D. C., 1938.

"Marketing the Late Crop of Potatoes," U. S. D. A., Washington, D. C., Cir. 475, June 1938, J. W. Park.

"A Graphic Summary of Agricultural Credit," U. S. D. A., Washington, D. C., Misc. Pub. 268, Sept. 1938, Norman J. Wall and E. J. Engquist, Jr.

"Cotton Marketing in the Irrigated Southwest," U. S. D. A., Washington, D. C., Mimeo., June 1938, J. W. Wright and J. R. Kennedy.

"World Acreage and Production of Tobacco by Countries," U. S. D. A., Washington, D. C., Historical Series, Aug. 1938.

"Marketing Agreement Regulating the Handling of Grapes Grown in the Counties of Washington, Benton, and Madison in the State of Arkansas," U. S. D. A., AAA, Washington, D. C., Agreement 76, A-14, July 15, 1938.

"Marketing Agreement Regulating the Handling in Interstate and Foreign Commerce, and Such Handling as Directly Burdens, Obstructs, or Affects Interstate or Foreign Commerce of Fresh Prunes Grown in Umatilla County in the State of Oregon and Walla Walla and Columbia Counties in the State of Washington," U. S. D. A., AAA, Washington, D. C., Agreement 77, A-15, July 19, 1938.

"Marketing Agreement Regulating the Handling of Hops Grown in the States of Oregon, California, and Washington," U. S. D. A., AAA, Washington, D. C., Agreement 78, A-16, Aug. 11, 1938.

"Changes in Technology and Labor Requirements in Crop Production—Corn," WPA, National Research Project, Phila., Pa., Report A-5, June 1938, Loring K. Macy, Lloyd E. Arnold, and Eugene G. McKibben.

"The Classification of Cotton," U. S. D. A., Washington, D. C., Misc. Pub. 310, May 1938.

"Check List of Standards for Farm Products Formulated by the Bureau of Agricultural Economics, U. S. D. A., Washington, D. C., Mimeo., June 1938.

Little Nellie's mother was entertaining a famous aviator. After he had finished a thrilling story, little daughter sighed deeply and said:

"I've clear forgot how it feels to sail through the air."

"Why, Nellie," said her mother, in a shocked voice, "you were never in the air in your life."

"Gracious! Mamma, have you forgot that the stork brought me?"

It seems the gate broke down between Heaven and Hell. St. Peter appeared at the broken part of the gate and called out to the devil, "Hey, Satan, it's your turn to fix it this time."

"Sorry," replied the boss of the land beyond the Styx. "My men are too busy to go about fixing a mere gate."

"Well, then," scowled St. Peter, "I'll have to sue you for breaking our agreement."

"Oh, yeah," yeah'd the devil, "where are you going to get a lawyer?"

The Tractor Industry Began in Wisconsin

By A. W. Hopkins

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TWO plucky Wisconsin engineers, struggling against more than a liberal helping of adversity and facing their full share of opposition, laid the foundation for the vast tractor industry of today. The two men, often accused of being visionary, dared to dream of a gasoline engine pulling plows or other farm machinery up and down farm fields in this and many other States.

It was while studying engineering at the University of Wisconsin, that C. W. Hart and C. H. Parr recognized, as did many others, the shortcomings of the steam engine when called upon to pull farm machinery. While others wondered what could be done about it, the Wisconsin engineers dared to think something might be done about it.

These men knew that even stationary steam engines called upon to drink the alkali waters in the Dakotas and on the prairies of Western Canada often rebelled. Under the hard pull of a full load of plows in tough prairie sod, steam boiler flues, surrounded by alkali water, would burn out in a few days. Besides they were aware that in many localities water was a very scarce article, obtainable only from dirty sloughs which had a very bad habit of drying up just when water was most needed.

Hart and Parr saw all these things and yet dreamed that they might build a tractor that would burn gasoline and kerosene for fuel, which would be lighter in weight than a steam engine of the same horse power, and which

HAVE SEEN 17 YEARS OF HARD SERVICE
GOING TO FARGO NATIONAL TRACTOR DEMONSTRATION
WILL MEET THE LATEST MODELS
HART PARR 30 & HART PARR 20

One of the first models on its way to the exhibition.

would be able to stand the strains of uneven ground. They even dared to believe that they could use oil for cooling the motor.

Their dream was so different from current practices that builders of steam traction engines laughed at the dreamers. When from their shop there came very crudely built machines, competitors freely heaped ridicule upon the investigators. Despite open ridicule and not a little antagonism, Hart and Parr went steadily on, and the gasoline tractor came into being, subject of course to constant and frequent change.

They built their first tractors in two sizes, which were very similar in design. The larger of the two was called "60" as that was approximately the horse power it would deliver to the belt. The smaller tractor was dubbed the "45" for the same reason. The "60" became the most popular and formed the major part of the company's output from 1904 to 1916. During that period the firm brought out several other models, most of them designed for some special purpose, but the "60" continued in greatest demand.

At the Iowa Centenary Exhibition held in connection with the Iowa State Fair this year, three of these old models were shown. One of these was old No. 3, one of the first three to be produced. It is still in running order but was sold 5 years ago to the Rosenthal Museum in Chicago and borrowed for the Iowa exhibition. Another on exhibit was a "60" which probably was built considerably earlier than 1916 and is still in use on the farm of a man living at Dallas Center, Iowa.

Still Being Used

The third tractor at the exhibition was a "35" which was one of the models brought out about 1910 and used especially for building and maintaining roads as well as for belt work. This machine is now owned by a man living near Calmar, Iowa. When visited for the purpose of trying to get the loan of the tractor for the Iowa exhibition, the visitors found him threshing with it. By furnishing him with another machine with which to finish his threshing, they were able to secure his machine to exhibit at the Iowa exhibition.

Extra Potash & Borax Grew Good Celery

(*From page* 15)

Plants curled up, stems were cracked across the fibers, or split open at the base. Soil tests showed a pH of 6.6, or slightly acid. Both phosphorus and potash tested low. The field had been growing vegetables for 6 years and had just been limed. Professor Young of the Waltham Field Station agreed with Extension Agronomist Donaldson and County Agent Handy in diagnosing the trouble as a deficiency in some minor element, probably boron.

Mr. Lawrence promised to cooperate in holding field trials and followed his usual program of fitting the soil and fertilizing with 1 ton of 5-8-7 mixed fertilizer per acre. Plots measuring 25 x 35 feet were staked out, and extra superphosphate, manganese sulfate, magnesium sulfate, hydrated lime, borax, extra muriate of potash, and nitrate of soda were applied. Not only early celery, but Pascal celery, beans, beets, spinach, rutabagas, and cauliflower were grown on the trial plots.

By August 1, the extra potash plots

had the best growth of any, while the extra lime plots were poorest. Celery first showed stem cracking, the common symptom of boron deficiency, August 20, on the lime, magnesium, and check plots. By September 1 all plots except the two borax treatments were affected to some extent.

A side application of borax was made September 2 on the poorest row in the check plots, then badly cracked and stunted. Improvement started in 2 weeks. The hearts began to grow, and the final yield actually was the best in the field.

All borax treatments produced a profitable volume of celery. Quality was excellent. Extra potash was the only other fertilizer material to produce a yield to compare with the borax plots. Muriate of potash was used in the tests.

While extra potash improved the foliage and quality of spinach, beets, beans, and rutabagas, no significant increase in yield followed. Extra lime depressed yield. Borax plots showed better quality, especially with rutabaga turnips. Cauliflower made little response to any treatment.

Massachusetts soils seem to be near the danger line in boron supply. Liming to the neutral point lessens the available boron. Soil testing should always precede lime. Over 80% of the farm soils tested by the Middlesex County Extension Service last year needed potash. By contrast, over 80% had enough phosphorus, and 65% had sufficient lime.

Replace Minor Elements

Minor elements, manganese, boron, iron, etc., usually become deficient following extreme practice, such as overliming, single cropping, or overfertilizing. Replacing these minor elements requires only small amounts. Borax is applied at 10 to 30 pounds per acre. An excess may be just as harmful as a deficiency. Farmers should consult their county agent, experiment station, or other competent authority before using minor elements. Soil tests should guide the lime and fertilizer program.

How to Fertilize Cotton in Georgia

(*From page* 22)

from quick-acting inorganic sources, such as nitrate of soda and sulphate of ammonia. If the fertilizer is home-mixed, addition of at least 10 per cent of some conditioner like cottonseed meal will make it easier to handle the fertilizer in the distributor. Unless the mixture is in good mechanical condition, the distributor will not put it out uniformly. The acidity from acid-forming nitrogen materials may be neutralized by mixing with it some limestone. It requires about one pound of limestone to correct the acidity resulting from the use of one pound of sulphate of ammonia.

Possible injury to young cotton plants may be avoided by side placement of the fertilizer. If the fertilizer is put down in a small stream in close contact with the seed, injury to the stand is likely to result. There are numbers of different kinds of fertilizer distributors now on the market which place the fertilizer to the side of the seed rather than directly under the seed. If the fertilizer is mixed in the drill with a plow before cotton seed are planted, the danger of injury to the stand will be much less than if the fertilizer is not mixed with the soil. By applying a part of the nitrogen and potash as a side-dressing at chopping time the danger of fertilizer injury to stands may be further reduced.

For Sea Island cotton apply 300 to 400 pounds of a 3-8-8 fertilizer per acre at or before planting without any side-dressing.

Farmers Become Their Own Bankers

By E. B. Reid

Director, Information and Extension, Farm Credit Administration, Washington, D. C.

IN 4 significant years America's farmers have overturned a hoary fallacy, widely believed as it was groundless. This was that the average farmer doesn't know how to run his own business—is, in fact, a child in matters of financing the annual operations of range and farm.

At the end of 1937 upward of a quarter-million men of the soil were shareholders in 550 short-term crop and livestock financing institutions, which since early autumn of 1933 had done approximately a $800,000,000 business. These 550 grass-root banks, called production credit associations, cover every agricultural area in the United States, are at the service of every producer from the soil who has a sound credit rating, serve as a constant source of dependable credit. Every borrower from a production credit association purchases a voting right in its affairs with his acquisition of stock; with that vote he helps select the board of directors that will manage the business of the association in his behalf. Democratic control of the constructive lending activities is the rule with these farmers' credit organizations.

Those who still cling to the moss-grown belief that a farmer and his money are soon parted may be dumfounded to learn that each production credit association has a committee of the farmer-directors who decide upon the merits of every application for a loan. It is this loan committee's exacting job to weigh the applicant's reputation for meeting his obligations, assess his capacity as a producer, the chances of a good market for the commodity he wishes to finance—exactly the same questions a country banker, or other private lender, would or should ask himself before closing a short-term production loan.

Production credit associations are designed each to cover a territory which will insure the organization's becoming self-supporting through adequate loan volume and the resultant income from interest. In the nation's areas of concentrated farming this means two or more counties may be embraced by a single association. The more sparsely operated territories of the West, where livestock is the prevalent type of production, in some cases are served by a single State-wide association. In both instances, however, application takers have been appointed to cover outlying territory at a distance from the association's central office. County agents always serve as willing informants as to the whereabouts of the nearest representative of an association.

Loans Adapted to Needs

As with other permanent credit units of the Farm Credit Administration, loans offered by production credit associations are "custom made"; they are tailored, form-fitting, to the borrower's needs. This is the first consideration. The life of the loan is synchronized to the life of the commodity it is designed to finance; and interest—on a per annum basis—is charged, nevertheless, only for the actual time the borrower

makes use of the money. It does not require a year to plant and harvest a winter wheat crop; the grain farmer repays his loan in about 9 months. A dairyman borrowing from an association for the purchase of more cows is allowed to make monthly repayments from his milk and cream checks, thus permitting him to make satisfactory financial progress out of the normal returns of his day-to-day business. Such loans usually run from 12 to 18 months.

In the financing of the purchase of farm machinery and fertilizer the production credit associations have assisted farmers to cut down their interest payments through cash buying. However convenient a time-purchase may be, there is no arguing the economy of buying for cash. A Florida citrus grower recently wrote the secretary-treasurer of his production credit association: "Through loans from our association I have saved hundreds of dollars on the purchase of fertilizer and other supplies for my grove by taking all the discounts in cash." Incidentally, cash customers rate the most satisfactory with the implement and fertilizer concerns.

Perhaps an illustration of the operations of one of the outstanding production credit associations in the country may serve to point up this brief exposition.

Out in the rich San Joaquin Valley, in California, the Visalia Production Credit Association put on its books $2,989,000 in the first 11 months of last year. This represented loans disbursed on 33 types of wealth-producing commodities, ranging from bees to watermelons and hitting oranges, range cattle, and cotton in between. The association embraces but two counties, yet here was a scant year's business rivaling that of any bank in the valley's 200 miles expanse. Since it received its charter from the Farm Credit Administration in December, 1933, the association's members have bought class B (voting) stock in the amount of $134,255—a sizeable stake. Net earnings in 4 years amounted to $67,615. Its losses, including reserves set aside for losses, have been less than one-half of one per cent.

Federal Refuges Use Land Unsuited for Cultivation

Drainage of marsh and swamp areas for crop land and quick profits has too often been unprofitable because the soil was poor and drainage expensive. Too, the natural habitat of many valuable birds and fur-bearing animals was destroyed, leaving them with little opportunity to reproduce.

Wildlife is worth hundreds of millions of dollars annually, says the 1938 Yearbook of Agriculture, "Soils and Men," and this return can be maintained and even increased by giving proper consideration to land planning.

In some areas, where attempts at drainage proved costly and unjustified, the land has been restored to marsh and swamps. An example is Lake Mattamuskeet in North Carolina. Here an expensive system of dikes and an elaborate pumping plant were installed to drain more than 50,000 acres of land. The project was never a success although it was tried for several years. Originally, the lake was an important refuge for greater snow goose, the whistling swan, and other waterfowl. As a Federal refuge it has been restored as a haven for these wild fowl.

The creation of large public reservations, however, is not the only way in which land can be restored as a home for wildlife, the Yearbook points out. Almost every farm has some unused portions that may be used profitably by wildlife.

High-quality Tomatoes Must Have Potash

(*From page* 16)

whereas Mr. X's soil showed a very limited supply. These findings were also borne out when soil tests were made on the check plot of the field at Smart Brothers, and on that portion of the field receiving the extra potash.

Based on these observations, it would appear that an adequate quantity of available potash is one of the primary requisites for uniformity and quality in the production of tomatoes.

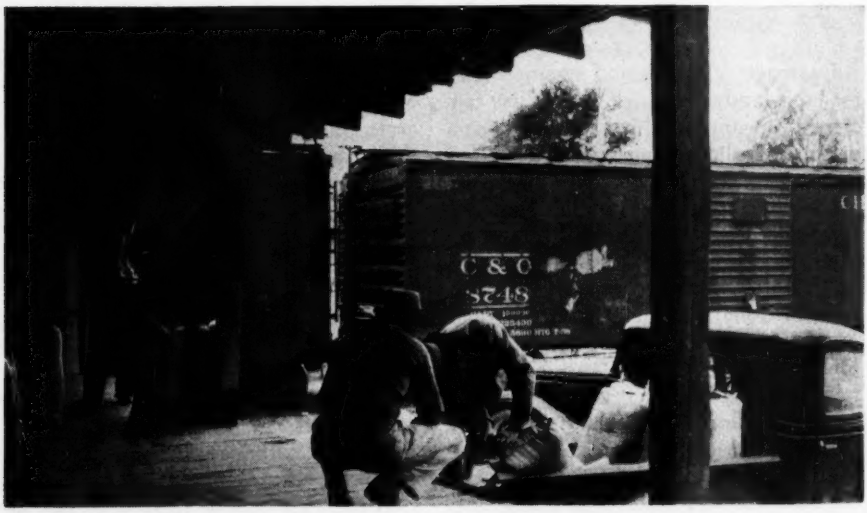
Earn Soil Payments with Winter Legumes

(*From page* 9)

showing farmers getting their seed and also the various steps in inoculating legume seed with pure culture as demonstrated by the County Agent.

The records show that 500 Bertie farmers are participating in this program. The number of share-croppers cooperating with their landlords in using these seed will more than double this number. Orders ranged from one bag of Austrian winter peas, with P. R. Gillam of Windsor getting the largest order consisting of 2,000 pounds hairy vetch and 8,000 pounds Austrian winter peas, enough vetch and peas to seed 275 acres. This is the first time Mr. Gillam and many of the other farmers have seeded vetch and peas.

All farmers who were seeding the crops on land for the first time were urged to inoculate them, and practically all of them got culture for inoculating the seed. The total amount of vetch received and delivered was 88,000 pounds, and 62,000 pounds of peas, making a grand total of 150,000 pounds, enough to sow 5,000 acres. The records show that cooperating



Every bag of seed had to be checked before it was hauled away.

farmers got inoculating culture to inoculate 137,200 pounds of these seed, or more than 9 out of 10, and most of those not getting culture were seeding on land that had grown vetch or peas before.

A pamphlet was prepared by the County Agent giving directions for inoculating the seed, also instructions on seeding, and an outline of several demonstrations. Farmers were requested to conduct one or more of the demonstrations listed, so that they and their neighbors may see the value of the winter legume to the crop following it. These demonstrations are as follows:

(A) 1. Vetch or peas inoculated
2. Vetch or peas not inoculated

(B) 1. Vetch or peas
2. No cover crop

(C) 1. Vetch
2. Check—no cover crop
3. Peas

(D) 1. Vetch
2. Peas
3. Check
4. Crimson clover

(E) 1. Check
2. Vetch or peas
3. Vetch or peas, same as No. 2 fertilized with 200 pounds 16 per cent superphosphate and 100 pounds muriate of potash per acre

(F) 1. Vetch or peas
2. Vetch or peas, fertilized with 500 pounds basic slag per acre
3. Vetch or peas, fertilized with 500 pounds basic slag and 100 pounds muriate of potash per acre
4. Check

From these seedings we expect to get a number of real soil-building demonstrations which will be of value in future years. The 1939 summer crops on these demonstrations will be corn, cotton, and peanuts. In connection with the above tvpes of soil-building demonstrations with winter legumes, the value of lime, phosphate, basic slag, and potash is being demonstrated throughout the county.

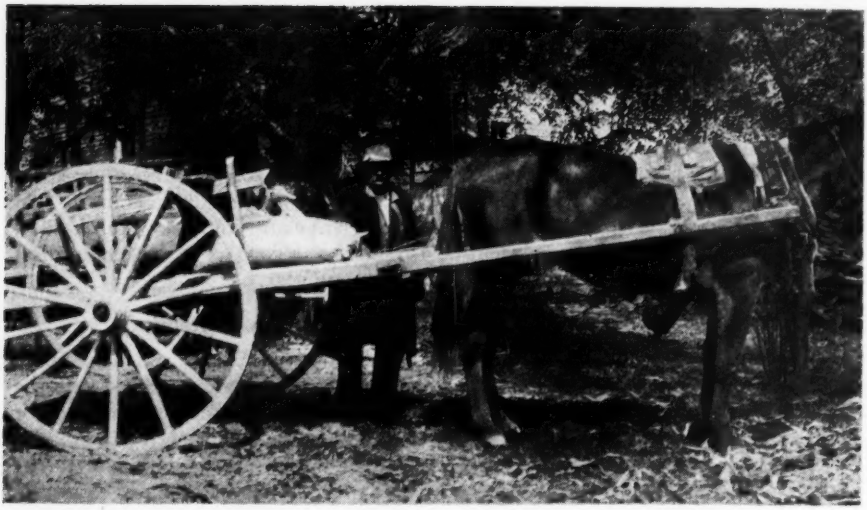
We are advised that this amount of winter legume seed is more than has ever been seeded in any one North Carolina county before, is more than had been seeded in Bertie County since the time it was made a county, and we challenge any county in the U. S. A. to show a record of a larger seeding in any one year.

Winter Protection

We find that Bertie farmers really appreciate this grant of aid from the Government in helping them to cover their fields with winter legumes. Instead of the soil being left bare to the elements this winter to suffer loss from leaching, it will be protected with a carpet of green vetch and peas that will add badly needed nitrogen and organic matter when turned under next spring. We believe that this experiment is the greatest work that could have been planned to help farmers really make a start towards conserving and improving their impoverished soils. With an early start next year, it should be possible to get twice as much acreage seeded in the fall of 1939 as was seeded this year. Many farmers state that they would like to have the AAA Program allow a larger part of their payments in winter legume seed, so they may cover a larger acreage in winter legumes.

On account of the short crops of cotton, peanuts, and tobacco this year as a result of excessive rains and boll-weevil damage to the cotton, Bertie farmers would have been able to seed only a small percentage of this acreage if the AAA Program had not provided this opportunity. Many farmers who were not interested in the Conservation Program in 1936 and 1937 have become interested through the winter legume program, and those who received no payments in 1936 and 1937, giving no particular attention to soil improvement, now see where the AAA Program helps them do better farming.

In seeding this acreage to winter



All kinds of conveyances were used to carry the seed away. This negro farmer used a mule and cart.

legumes, they will not realize that the seed have ever really cost them anything, since the AAA Office will deduct this cost from their soil-building payment. Most of them had not earned the full amount of this payment in 1936 and 1937. They will receive credit of $1.50 for each acre seeded to reach their goal, and it is expected that a similar payment will be allowed in the 1939 program for turning these crops under; so that in the final analysis the seed have not cost the producers anything, but will be an aid from the Government to farmers to help them conserve and improve their soils.

Thus we see that the Agricultural Conservation Program furnishes the opportunity of getting farmers to put into practice what the Extension Service has been advocating for these many years, and with the combined efforts of the two, much more effective results may be secured. Instead of compliance reports from Bertie County farms in 1938 showing the majority of them not reaching the soil-building goal and having to take a deduction for this deficiency, most of them will have fully reached their soil-building goal, and many of them will have carried out more soil-building practices than they can be paid for. Furthermore, Bertie farmers will have demonstrated that the first objective of the Agricultural Conservation Program can be more fully met through winter legume seed as a grant of aid to help them improve their soils.

E. I. Morrison Diversifies Farming

(*From page* 19)

of that time. In 1937, cooperating with his County Agricultural Agent, Mr. G. C. Smith, he conducted a fertilizer demonstration trying various kinds of fertilizer on sweet potatoes. Mr. Morrison's belief in fertilizers was certainly justified by the results of this demonstration. This year he used 800 pounds of 4-10-7 per acre on all of his sweet potatoes where he has formerly been using 500 pounds of 4-12-4.

Mr. Morrison's potatoes are all State

certified. He obtained his first certified stock from the Louisiana State Experiment Station at Baton Rouge. His reputation as a sweet potato producer has spread so far that Hon. Harry B. Wilson, Commissioner of Agriculture in Louisiana, often forwards to him for answering, letters from far and near requesting information as to cooking recipes, palatability of varieties, quality, etc.

This sweet potato crop is cured and stored in two dry kilns that have a combined capacity of 1,700 bushels. Since his acreage is small and certified, he disposes of his crop to local trade for consumption or for seed. He also trades potatoes to local stores for farm supplies.

To complete his diversified farm program his livestock consists of 3 mules, 16 head of Jersey cattle, 100 hens, and enough hogs to keep his family well supplied with meat which is cured and stored in a cold storage plant at Alexandria.

Mr. Morrison still finds time to work with his neighbors on community projects. However, his practice and conviction that to get the most out of his land, fertilizer must be liberally applied, has contributed much to make him one of the leading farmers in Grand Parish.

Selling Forage as Steaks and Chops

(*From page* 14)

ing his feed and forage with livestock depend upon the difference between the cost of producing his animals, or their purchase price and their market value. He is desirous of producing the quality of meat or other products that finds the greatest favor with the consumer, and hence also at livestock markets, if it can be done without prohibitive expense. Given a certain number of home-grown or available feeds, the farmer's problem is to combine them so as to produce the greatest possible tenderness and palatability in the meat. He must consider the kind, age, sex, breeding, and weight of the livestock to be fed; likewise the kind, quality, quantities, and prices of the grain, hay, silage, and pasture which are available or obtainable. Equipment, labor, time of year, and probable market are other factors which must be studied. Only then can the course be laid out and the decision made as to whether the product will be cow beef or baby beef, medium quality or choice beef, stackers or feeders, to be supplied to other regions for finishing purposes.

The ultimate success of the plan to diversify the farm program with livestock cannot be measured by the results of any one year any more than it can with the one-crop system. Farmers in one county during one year may show a profit from the all-one-crop system, while the farmers of a nearby county, depending chiefly upon cattle, make less. Perhaps the following year the situation will be reversed. Human nature is such that we forget our losses and number our triumphs and are content, yet that is neither good business nor sound agriculture. You cannot strike an average of two such groups of farmers and say that they are fairly prosperous, over a period of years. If, therefore, a judicial balance of crops, pasture, and livestock will enable a great majority of farmers to prosper year in and year out, that is the system to tie to. We know that such a system will do just that thing in many sections. We have every reason to believe it will succeed in many others.

Call cotton, tobacco, wheat, or any other product of the soil your money crop if you like. Manage your business to that end, but give improved

livestock intelligently handled an opportunity to show you how they can enable the so-called money crop really to justify its title.

In the past, the viewpoint of many farmers has been, "how much feed will I have to buy with my cotton money to carry my livestock until pasture comes in the spring?" Too often it has not been sufficient, resulting in poorly fed animals and heavy purchase of feed when prices are highest. The viewpoint in reality should be "how much land will I need to plant in order to produce sufficient feed crops to carry my livestock until the next harvest with some to spare?" In this connection it is well to keep in mind that hay stacks and bulging granaries are the livestock producer's greatest security.

For Increased Production

In addition to corn, which is rather generally produced throughout the South, we sometimes ask the question, "how may we increase the production of corn, and is there a substitute for corn?" Among the points to be considered in order to do this are:

(1) Making better use of silage. In this connection the trench silo has and will continue to find an important place. It may also be possible to produce two silage crops on the same land during the year, thus greatly increasing the total nutrients per acre.

(2) It is important that more attention be given to crop rotations that will produce the greatest total yield of digestible nutrients per acre. It is urged that more attention be given to pasture in the rotation, as it has been shown that the total yield of nutrients produced per acre by such methods will be greatly increased.

(3) Certain varieties of oats are making most satisfactory yields and are worth almost as much as corn, pound for pound, for workstock, and for feeding other classes of livestock.

(4) Winter barley in the northern part of the South may be found to be one of the possibilities of increasing feed production. Consideration, however, will need to be given to possible damage from rust and insect pests. It is possible that this crop will be damaged less by pests than will corn from occasional dry weather.

(5) Corn and velvet beans have been used successfully in some sections in the past and may have greater possibilities than have yet been developed. The limitations of this crop, however, are pretty generally known.

(6) Grain-sorghums probably have greater possibilities in the Mississippi Delta and similar areas than have been developed to date.

(7) Sorghum for silage is perhaps one of the most dependable crops. It is from 85% to 90% as efficient as corn silage, and the yield is two to three times more per acre.

(8) Perhaps an increase in the production of digestible nutrients from hay crops would be the way of least resistance for many farmers at first thought. The production and making of good hay, either from the annual legumes, such as, soybeans and cowpeas, as well as from alfalfa, lespedeza,

Johnson hay grass cut at the proper stage of growth is an excellent roughage.

or Johnson grass, requires that it be cut at the proper stage of growth and be properly cured and stored for best results. To do this requires careful planning of the cropping system, proper hay-making equipment, and adequate storage facilities. One ton of legume hay is ordinarily considered equivalent to three tons of silage. By cutting the hay during the early stages of growth, the digestible nutrients per ton may be increased considerably, although such a practice possibly decreases the yield over a period of years. The cost of producing silage is estimated at from $2.50 to $4.00 per ton, and that of producing and storing hay from $4.00 to $6.00 per ton. The following table indicates the total digestible nutrients produced per acre of the different feed crops based on the average production over a period of years. The average yield of feed crops will appear very low to some, especially to farmers situated on good soil who may produce annually two, three, or even more times the average yield of all farms producing the crop. This fact should be taken into account when planning feed requirements and production possibilities for any given farm in any region.

COMPARATIVE QUANTITIES OF DIGESTIBLE NUTRIENTS PRODUCED PER ACRE—CALCULATIONS BASED ON AVERAGE YIELD IN SOUTHEASTERN STATES FOR THE 10-YEAR PERIOD 1922–1931

Feed Crop	Yields Per Acre*		Total Digestible Nutrients	
	Concentrates	Roughages	Harvested	Grazed†
	Bushels	Tons	Pounds	Pounds
Corn, ears	16	.....	792	.....
Barley	18	.80	1,200	.....
Oats	22	.85	1,089	.....
Wheat	10	.60	774	.....
Grain sorghums	14	.75	1,280	.....
Alfalfa	.....	1.50	1,605	1,204
Lespedeza	.....	.70	742	557
Annual legumes	.....	.80	832	624
Johnson grass	.....	1.00	1,016	762
Cereal hays	.....	1.00	986	740
Corn stover	.....	.70	647	.....
Corn silage	.....	3.20	1,152	.....
Sorghum silage	.....	6.40	1,743	.....

* The percentages of grain and straw respectively are of the total crop yields as follows: ear corn 55, stover 45, oats 35, straw 65, barley and wheat 40, straw 60. The yield of silage is based on the assumption that 1 ton of silage will be obtained for each 5 bushels of corn it would produce.

† It is estimated that 75 per cent as much digestible nutrients are produced when pastured as when cut for hay.

From the above table, it is noted that:

(1) Corn and alfalfa produced much more total digestible nutrients per acre when harvested than when grazed with livestock.

(2) Oats, barley, and other crops sometimes cut for hay at an early stage of growth have slightly more nutrients when harvested.

(3) It is estimated that a rotation in any State on good land will produce from one-half to two-thirds more digestible nutrients when harvested than when the same crops are grazed.

Whether research worker or livestock producer, in making plans to make greater use of roughages and home-grown feeds to develop a successful

farm program, there are certain goals we need to keep before us. Our efforts should be to make them sound, useful, and practical. This is necessary because the farmer thinks not only in terms of acres of crops, or number of animals to be fed, or of farm needs, but also in terms of dollars and cents from his own and the family's work for the year. Plans, methods, and research designed to help accomplish these objectives should among others include:

We have ample opportunity to increase the yield of nutrients per acre by increasing the corn yield.

(1) Increase the yield of digestible nutrients per acre from all pasture, feed, and forage crops grown.

(2) Determine the kind, class, and type of animals best adapted to the use of increased amounts of pasture and other forage crops, thereby reducing the cost of production without impairing the quality of the products produced.

Farm Samaritans

(*From page* 5)

the more normal working of the program. This time the operator and his wife had been renters, but three crop failures by drought wiped out their assets and left them with a $200 debt not fully covered by forced sale of the team and implements. After two years on meager day labor and relief, a federal loan was secured. Investigation proved them to be thrifty, capable, and honest, so $600 was advanced on an ordinary character loan, enough to buy a team, seed, a few tools, some feed, and family supplies. His debt was scaled down and installment payments arranged. The county supervisor helped him lay out a diversified farm program on 40 acres of rented land. In one year this man and his family had paid over half their debt to the government and met other obligations on time. The wife had canned nearly 500 quarts of fruit and vegetables from her own kitchen garden, and a milk cow and a small poultry flock eked out their needs. The family pitched in and built a small addition to the house, and next season they expect to rent a little more land.

SUCH folks used to be regarded as unsafe commercial risks by country bankers, and very few of them were ever reached by the general extension programs. One home economics supervisor in our northern counties has returned as a Security worker in the section she once served as county home agent, but she says the folks with whom she deals now were unknown to her in the heyday of her regular extension duties. "We simply didn't meet them," is her comment, "for they had no means to carry out our recommendations, and we sought those who could and would."

Increased school attendance, better nourished children, stronger mothers

and infants, more courageous men, ownership of a vast amount more work stock and chattels, and a hopeful horizon for hundreds—surely this is a worthwhile investment in rural America. It is surely good policy to save two or three good men and their families for every partial failure encountered in this service.

INDEED I find that many of the subsistence loan clients are not only better on making payments but are more regular in bookkeeping and cost accounting than hosts of farmers who have not applied for relief. In my own State the roster of repayments made by loan clients show that they are far ahead of due date maturities, and taking the country over authorities say that of more than 700,000 borrowers under this system, fully 80 per cent will return every nickel advanced to them from the treasury. In matters of management via the farm accounting and farm planning method, the clients are obliged to follow the regulations calling for definite farm and household estimates and schedules. All the good old extension service could ever do was to hand them a form book and show them how to fill it in—on rainy days and Sundays, if they didn't go fishing.

TWO projects assigned at one time to the Security people have never been so furiously popular with the staff. One is the direct dole or emergency grant, and the other is the vague program of resettlement. Each has its obvious difficulties according to zone and temperament, and I dodge them for fear of exposing too much ignorance or prejudice.

Let me add this, however, that if I had a choice between trying resettlement (that is removing a group from a bad location to one more promising from the soil and market standpoint) and the direct un-American, enervating dole—then I would grab at the former by all means. Where families have persisted in squatting on isolated acreages that require expensive roads and schools to maintain them as part of a decent society, then somebody ought to shake them loose from their folly. But as I see it, the real job of the Security bureau lies in making modest investments in human welfare through supervised loans, and in trying to mend some of the mistakes in the farm tenancy tangle.

Now I admit that at the rate we have proceeded in the initial year of the Jones-Bankhead Act to grant tenant loans we will not catch up with the natural increase in tenancy in 50 years. This is because studies indicate that between 1930 and 1935 the average yearly increase in farm tenancy has been about 40,000 farms, while the tenant loans completed in the past fiscal year came to a trifle less than 2,000.

BUT far be it from me to draw any partisan or other half-baked conclusions from such a situation, for I verily believe that out of the studies and experience which F. S. A. workers get from close contact with tenancy in all sections of the country, we are going to strike eventually at some of the root causes of the renter and cropper problems—and with the help of awakened landlords and corporate managers—be able to publicize and circulate better leases. Better lease systems will be far greater help to the tenancy problem than meager loans scattered around the countryside, and mean more to the soil salvation besides.

Ultra conservatives ask me why all this furor over farm tenancy anyhow? They make me admit freely that some mortgaged farmers pay higher interest rates for less value received than renters pay for theirs, and the renter has less to worry about. They exclaim that city folks are heavier renters than country folks and manage to stand it. They say that landlords have been regarded as ogres and fiends, and all renters and share-croppers painted as abused saints, which is ballyhoo.

To which I counter with answers that renting is more common and growing

faster in the richer soil areas; that renters do not feel stabilized and settled anywhere, their families get the drifting habit, their general living standards are not high enough, and the terms of short-time, indifferent leasing plans work havoc with America's foundation asset, soil fertility. If I get mad enough to be sentimental, I thrust at them with the old wheeze about native agricultural tradition lying in farm operation by independent ownership. But tradition and heroics do not solve the problem. In fact, it will bind you up as tight as red tape, and everybody in the Federal service knows what that signifies in terms of status quo.

FORTUNATELY, the F. S. A. undertook its first year's effort to administer this new law with two broad bases in view, namely, to get good men and women matched with good land. They had plenty of hurdles to leap, including the pettifogging political ones. But with the aid of county tenant loan committees whose majority proved sane and reasonable, they went at it with caution and conservatism. With twice the amount available next year and more counties open to loans, the effect of the program must begin to shape itself directly.

AS generally operated last year the tenancy loan deal, as I said, picked the best kind of experienced renters to take over as good farms as a reasonable price could obtain. This means that we have in theory the proper balance, consisting of willing and capable operators tilling the better grades of soil. It has not resulted in any "slumming or rescue mission" stuff insofar as human assets are concerned, for few reforms of worthless individuals were attempted. It has not to any extent drawn back abandoned and costly estates into the surplus farm picture. Nor have new raw lands been opened up to create new overproduction bogeys.

Training schools, regulation accounts and records, character studies, and definite farm and home schedules again dominate the picture here, as with "rehabilitation" loans. The amortized payment plan is used, the interest rate is low, and a program of so-called "variable payments" suited to the harvest yields and fortunes of each year have been established in many cases.

My idea is that with this kind of a fresh start, and with a set of fellows in double harness with their wives and the government, we can get a better line on leases and terms favorable to a sane kind of tenancy than we have ever had before.

THAT means we may soon be able to set up these men as examples of tenant success—other things being equal—and out of their experience we may help investors in farm land to construct a far sounder fabric of tenant relations than anything we have stumbled around with before.

I think we can dismiss all fond hopes of ending farm tenancy through the Security program. It may be too late to stop tenancy, if we wished to do so. But thank heaven, it isn't to right-about-face on some of the evils of tenancy.

I petition the wise and watchful chaps charged with administering this law to publicize the underlying principles of landlord-tenant agreements of the better kind. Just because the government has bought some land to hand over to a select minority of former renters, this doesn't solve the problem for hordes of others freshly recruited to the ranks.

Maybe we've got to subsidize a few landlords before we get done with the job. Maybe that's another way to improve the situation more directly than to buy farms outright and shift renters into owners. But anyhow, let's keep plugging hard at the task—and it seems to be one far tougher to handle than the Pilgrim fathers faced dodging Injuns during their first Thanksgiving dinner.

TOO LATE TO START

A clergyman and a Scotchman were watching a football game together. The Scotchman continually kept taking nips from a bottle, and the clergyman, no longer able to restrain himself, at last cried out, "Sir, I'm sixty-nine years old, and never in my life have I touched alcohol."

"Well, dinnae worry yourself tae much," replied the Scotchman with a pronounced burr. "You're nae ginna start noo."

Twirp: "Just think, fella, every time I breathe somebody dies!"

Twill: "Ya got something there, guy. Why doncha try cloves?"

Sam, who works at the wash rack, was talking to his girl: "Liza, did you wear dem flowahs ah sent you de odder night, gal?"

Liza: "Yez, Sam, ah didn't wear nothing else but."

Sam: "Doggone, Liza, you musta near froze!"

"Lady, if you will give us a nickel my little brother will imitate a hen."

"What will he do?" asked the lady. "Cackle."

"Naw," replied the boy in disgust. "He wouldn't do a cheap imitation like that. He'll eat a woim."

Every year college deans pop the routine question to their undergraduates: "Why did you come to college?"

Traditionally the answers match the questions in triteness. But last year one University of Arizona co-ed unexpectedly confided: "I came to be went with —but I ain't yet!"

A woman visitor to the London Zoo asked a keeper whether the hippopotamus was a male or a female.

"Madam," replied the keeper, sternly, "that is a question that should interest only another hippopotamus."

"Who broke that chair in the parlor last evening, Jane?"

"It just collapsed, all of a sudden, father, but neither one of us was hurt."

"HOPE SPRINGS ETERNAL"

Son: "Father, I've got my heart set on a Rolls-Royce."

Father: "Well, that's probably the only part of your anatomy that will ever set on one."

Mrs. Hen: "I wonder what makes Mr. Gander look so seedy this morning."

Mr. Rooster: "He was out on a wild goose chase last night."

Pahson: "Well, Rastus, that's a fine garden you have."

Rastus: "Yes, Pahson."

Pahson: "Youse must thank the Almighty for that."

Rastus: "Yes, Pahson."

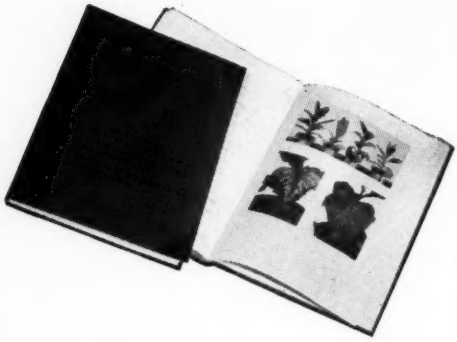
Pahson: "What a patch of cabbages you have there!"

Rastus: "Yes, Pahson."

Pahson: "Youse must thank the Almighty for that."

Rastus (eyeing Pahson thoughtfully): "Pahson, did you ebber see dis piece ob ground when de Almighty had it all to Himself?"

POTASH DEFICIENCY SYMPTOMS



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